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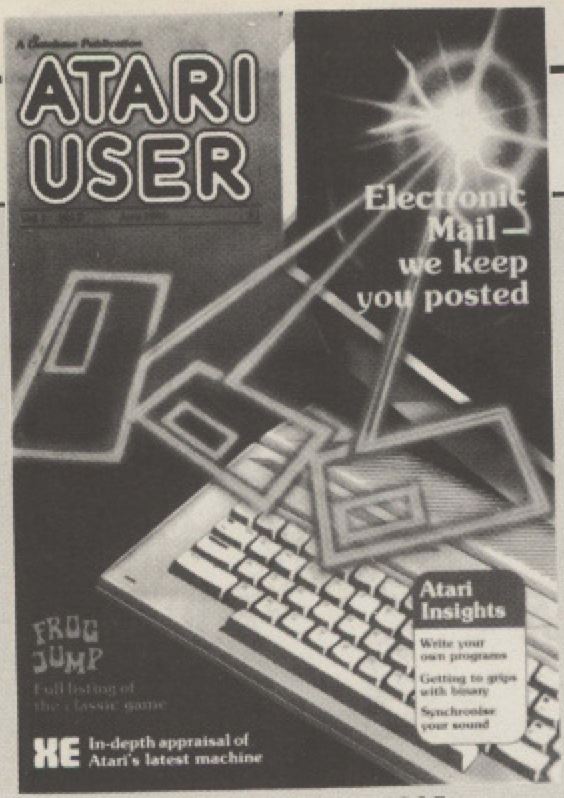
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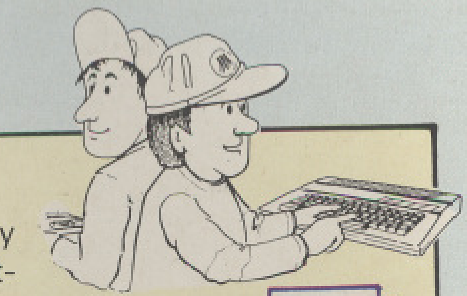
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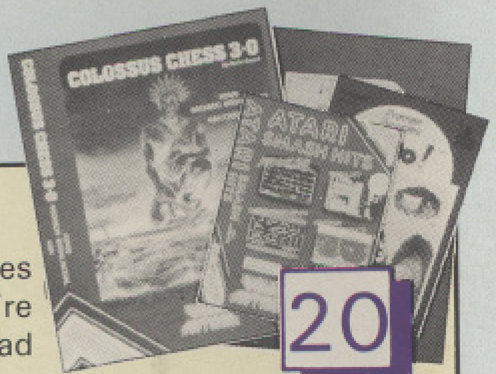
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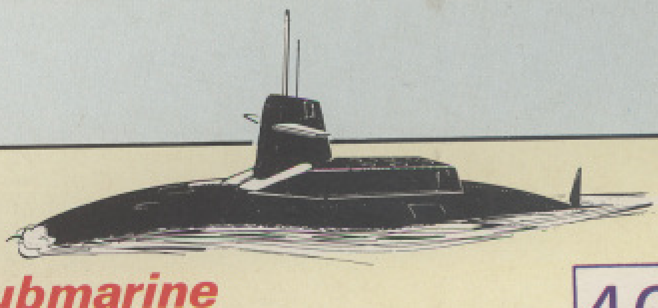
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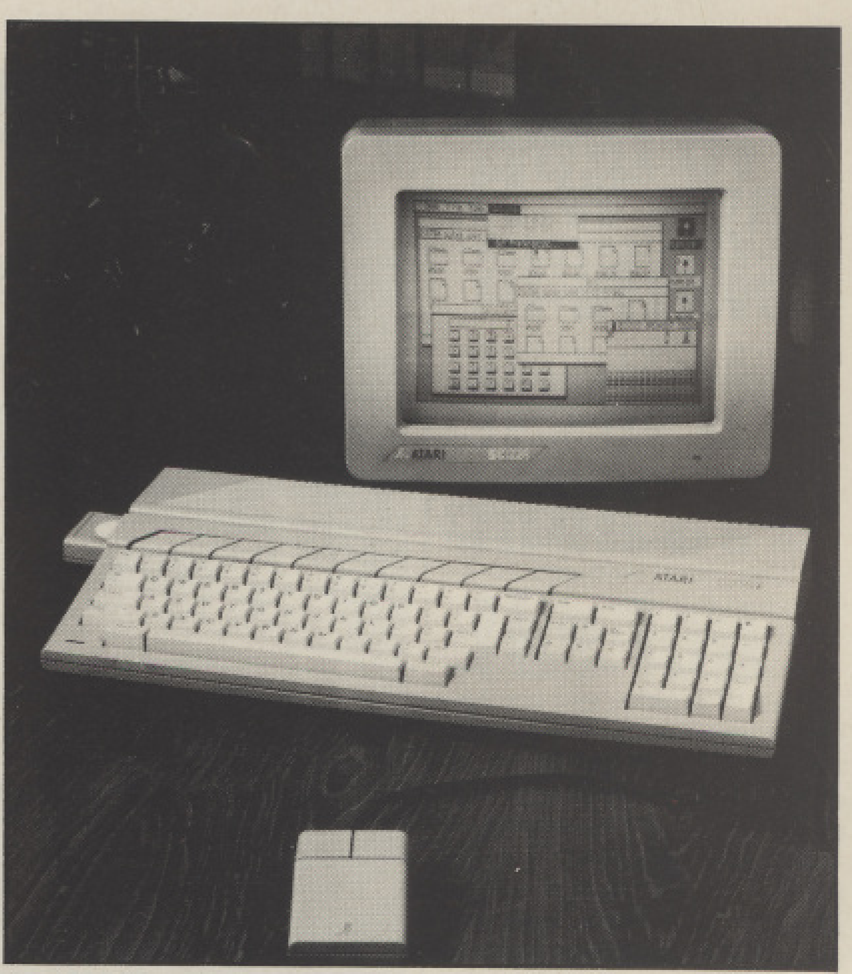






Contents

STs on way to whack the Macs



Atari 520 ST . . . due any day

BARRING a major hiccup, the first 520ST machines will be arriving in the UK within days of this issue of *Atari User* hitting the news stands, and will go on sale shortly afterwards.

And with this initial shipment Atari boss Jack Tramiel will have kept his promise to the UK.

That was that the British would be given the opportunity to buy the 520ST before anyone else in the world.

He gave this undertaking to *Atari User* when the new machine was unveiled for the international press corps at the recent Hanover Fair.

"We want the British to have them first", the Atari overlord said. "You see you (the British) are the most computer literate people in the world and, as such, you will have a true appreciation of the ST".

Carrying a price tag of £699, the new machine comes with a 500k 3½in floppy disc drive.

It is being seen as a real threat to Apple's £2,000-plus Macintosh.

This is due to the fact that it contains the Gem operating system, which provides it with a Mac environment at a greatly reduced price.

However the 520STs which appeared in Hanover were offering Gem only on disc.

But the company intends to have it on ROM by the time the machine goes into the shops.

"We have had a few machines out with Gem on disc for development purposes in software houses", said an Atari technical spokesman.

"They will help us identify the bugs so we can eliminate them before offering Gem on ROM at the time the machines get into the UK shops".



GUESS who's reading the Atari User? Find out on Page 9.

Line up to become a millionaire...

ATARI boss Jack Tramiel has promised to create a new breed of UK millionaire – authors of successful software for the new ST range.

"The more there are the better as far as we are concerned", he told *Atari User.*

This is all part and parcel of the new-look Atari's philosophy to call upon third parties to develop the software.

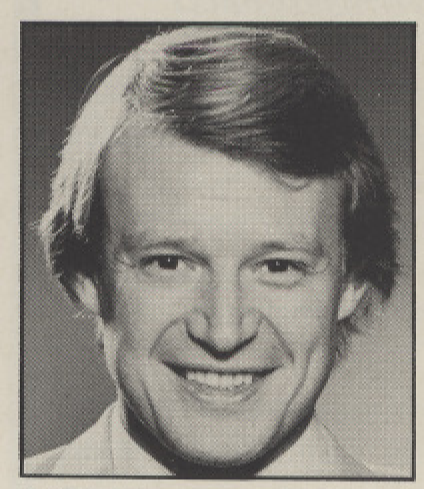
Since he took over at the top, Tramiel has axed virtually all the company's programmers – with reports circulating that up to 80 lost their jobs in the United States alone.

"We are now actively promoting third party software for the ST", says Max Bambridge, Atari's new European head of sales.

"And to help achieve this, we will be supporting software houses in every possible way".

However, the support does not include providing them with free development systems for the ST.

Instead, the software houses have had to pay $4,500 for the privilege of being able to write programs for the new machine.



Rob Harding . . . "companies realise they are backing a winner"



Jack Tramiel . . . "the more there are the better"

And it seems to be working.

According to Rob Harding, Atari UK's sales boss, at least 60 major companies based in the United States are currently writing software for the 520ST.

"It doesn't stop there, either", he says. "For here in Britain companies are also queueing up to pay for development systems.

"There is absolutely no doubt now that the ST will be more than well supported by good software. After all, the companies realise they are backing a winner".

And the final word from Jack Tramiel . . .

"Eventually we would like to see the youngsters in the UK get in on the act.

"What could be better than turning lots of bright 15-year-old programmers into millionaires . . ."

Exciting, says W.H. Smith

THE Atari 130XE has made a big impression at leading High Street chain W.H. Smith.

The new computer being sold at Smith's top 40 branches has been described by the buying team as "one of the most exciting new products to be launched this year".

Atari technicians accompanied the first machines delivered to Smith's and conducted on-the-spot staff training in the stores.

Atari has also set up a help line so that Smith's branch staff can ring with technical problems and customer queries.

W.H. Smith is also expecting big sales of the Atari 1010 program recorder.

The Atari 1050 disc drive is being stocked on a trial basis by five branches – Birmingham, Brent Cross, Croydon, Manchester and Waterloo.

Probe into cut price games

LEADING software houses are urgently investigating a mail-order operation offering top-selling games at rock-bottom prices.

Popular Atari titles like Pole Position, Ghostbusters and Jet Boot Jack are involved.

The software publishers were alerted by micro users who had received in the post an offer from a firm calling itself A1 Software Services of Hornchurch, Essex.

The mail shot invited people to choose one game from a list of 20 well-known titles which would then be theirs for only the cost of postage and packing – 25p.

The offer continued: "When you have received your free tape you can buy the following" and gave details of three packs, each containing 15 top games.

Price for one pack was £20, for two packs £30 and for all three £40.

Another version of the mail shot offered a choice of 21 packs containing five games each at prices ranging from £5 for one pack to £30 for 10 packs. The offer stated: "All titles are the ones from the well-known software houses. All copies are first-class quality and we will exchange any non-loaders. Please be very descrete (sic) with this list".

Atari User tried to contact A1 Software Services by telephone. Directory inquiries could find no listing in Hornchurch for the firm, nor for an "A. Croft" named as "proprietor" on the mail shot.

A visitor to the address given found it to be an accommodation agency-cum-escort agency in a run-down shop.

SHARING THE GOODIES

THE Centronics disc drive for the 520 ST will eventually be made available – with the appropriate interfaces built in – for other computers.

Good deal, says Atari

ATARI has hit back at allegations by a prominent UK distribution company that a deal offered by the corporation was "economic suicide".

The claim was made by Joe Woods, sales and marketing director of TBD, after his firm announced that it would no longer be handling Atari hardware.

"Conditions demanded by Atari – in terms of margins and stocking commitment – were quite simply unacceptable", he said.

"In the current market climate it would have been commercial suicide to go along with Atari's proposals,.

"Atari has a good product and we took the decision to cease distribution with some reluctance".

Up until the announcement, TBD had in fact been distributing Atari hardware under what the company describes as an "arrangement".

However, it was when TBD pressed Atari for a formalisation of the relationship that the storm blew up.

Over at Atari, Max Bambridge, head of European sales, saw the "problem" in a somewhat different light.

"We made a genuine offer in good faith", he told *Atari User*. "And this was made at the request of the distribution company itself.

"As far as we are concerned, if we are to get into bed with someone, we need to judge their level of commitment.

"We have a very hot product coming over in the 520 ST and so we intend to do business the right way.

"There is no question that we'll find ourselves in the position of giving the baby away with the bathwater . . ."

Heir of the dog

AFTER ditching the popular DOS 2 in favour of the DOS 3, which failed to appeal to users, Atari has now launched the new DOS 2.5.

The 2.5 version has the ability to format both enhanced and single density and is compatible with DOS 2 and 3.

"Our problem was that after DOS 2, which was very popular, DOS 3 turned out to be really a bit of a dog", admitted an Atari technical spokesman.

"So now we have incorporated all that was best in DOS and added a few enhancements and come up with DOS 2.5.

"This didn't present too many problems as it has been written by the same people who came up with DOS 2".

130 ST misses Hanover Show

ALTHOUGH the 520 ST dutifully took its bow at the Hanover Show, there was no sign of the 128k version, the 130 ST.

Nor is anyone at Atari prepared to give a firm date as to when the machine will appear.

"It may be at the end of the year or possibly even later", said one Atari UK source. "At the moment we are as much in the dark about it as anybody".

One person who admitted to being disappointed by the absence of the 130 ST at Hanover was Tony Deane, a director of Silica Shop.

"To be quite honest, one of the reasons we came over was in the hope of seeing that particular machine", he said.

"But we believe it will be well worth waiting for".

Mystery monitor

A NEW colour monitor with a built in disc drive made an appearance on the Atari stand at the Hanover Show.

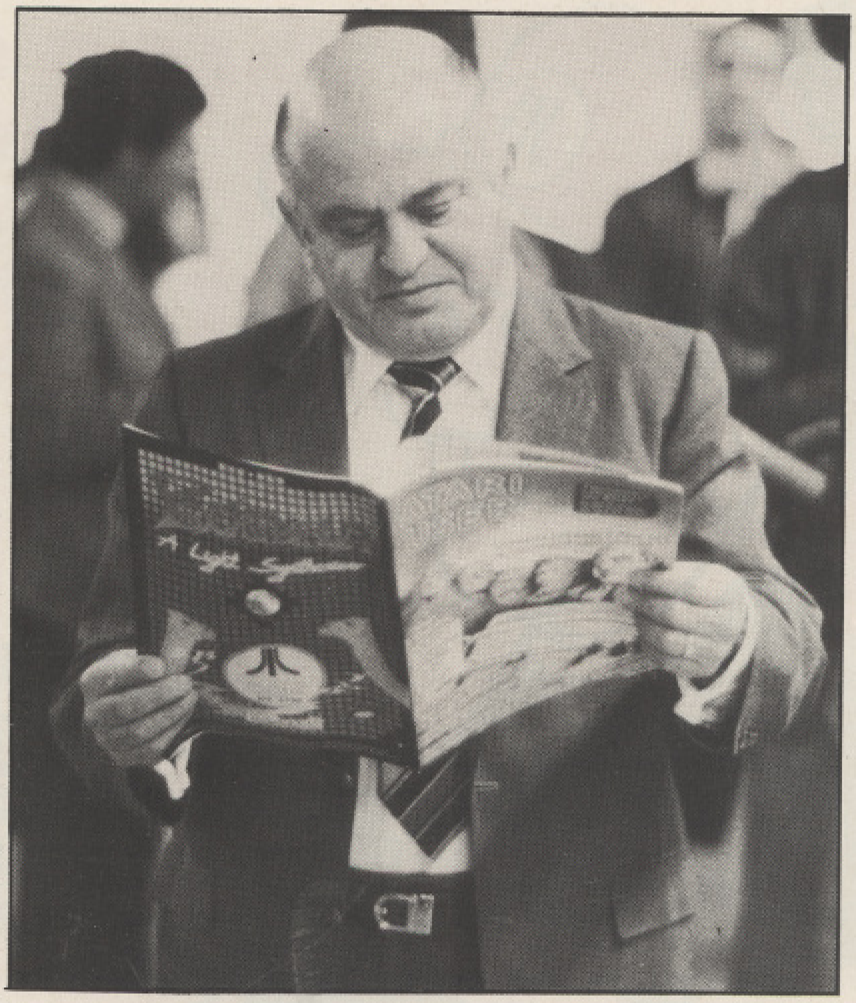
Known as the PS 3000, it carried no price tag and there was no indication of when it would arrive in the UK.

Good reception

REACTION to the new Atari 130XE has been exceedingly good according to Max Bambridge, the corporation's European sales and marketing chief.

"It is early days yet, but it is fair enough to say we are very pleased with the reception it has had", he told *Atari User*.

A major selling point for the 130XE is likely to be the fact that it is able to run all the software currently available for the 800XL – estimated at around 3,000 titles.



Seal of approval from the man at the top

ATARI User has already found its No. 1 fan. He turns out to be none other than Jack Tramiel, the battling boss of the corporation.

Presented with a copy of the first issue at the Hanover Show, the man who intends to do for Atari what he did for Commodore – $1 billion in sales – gave it his seal of approval.

According to one of his top aides: "He showed it to everybody – and I mean everybody".

In fact, at the request of Atari, copies of the magazine were inserted in all the press packs for the international journalists visiting the corporation's stand at the show.

The launch issue's cover depicted Tramiel's head carved out of stone alongside the likenesses of the four United States presidents to be found on Mount Rushmore.

And this prompted the comment from one US Atari executive: "Gee, I recognise this guy" (pointing at Jack) "but who are these other four?"

Precision Software rewrites for XE

A LEADING UK software house has jumped on to the Atari bandwagon.

Precision Software has announced it will be rewriting most of its titles for the new Atari 130XE.

However the company is biding its time before launching versions for the 520ST.

Already in the pipeline for the 130XE is the company's well known Superbase range – the Superbase database, Superscript, a combination of word processor, calculator and mailshot facility, and Supertype, a keyboard trainer.

However the ST versions, with extended series of applications templates for Superbase, are not likely to follow immediately.

"If software is made available for the ST I see it becoming very popular", said John Tranmer, marketing director at Precision.

"We are certainly looking very keenly at the ST. I myself feel very confident that it will be popular and we have the resources, as we see demand, to schedule development for it".

Precision Software started its operations in 1980 and since then has produced 18 titles for the C64, 14 for the Apple II.

The company prides itself on specialising in high-performance "productivity" software such as word processing and other database products.

These include Easy Script and Spell, which have sold 200,000 copies, and Superbase 64, which has sold 70,000.

Reflecting its worldwide market, Precision produces titles in several languages.

Its recent move into the Atari market was explained by Tranmer.

"We sell serious software for the smaller computers", he said, "and because of this most of it goes to the small businessman who cannot afford more than £1,000 for a system.

"The ST fits into this market. It is extremely well-engineered and its price offers a new level of technology to the serious home user or businessman.

"I think it will be a very successful product".

Keep y
and y
into c



THIS month we are going to begin to write our own programs. Nothing spectacular mind, but enough to give you a quiet glow of satisfaction. Firstly, let's discuss what we did last month.

We learned that to "talk" to the computer we had to speak to it in a language it already understood, called Basic. We also learned how to get the Atari to do sums for us and to print out messages, or strings as they are known.

One Basic word we used quite frequently was PRINT, which instructs the micro to write or print things out on the screen. For instance, to do the sum 4+4 we typed:

PRINT 4+4 [Return]

where [Return] means you should press the Return key – this sends the message we have typed to the computer. Hopefully it then responds by printing the correct answer, 8.

Similarly, we could do subtraction, multiplication and division – the symbols for which are –, * and / respectively. Notice particularly the division symbol.

We also learned that to print out messages we had to surround them with quotes, as we do when recording speech. So, to print the message "GOOD MORNING" on the screen we type:

PRINT "GOOD MORNING"
[Return]

which causes the message to be written on the screen. Now we can use lower case or small letters, so we can print "Good Morning" by using:

PRINT "Good Morning"
[Return]

providing we use our Caps properly.

Notice that PRINT itself remains in capitals. This is because it is a special Basic word – a keyword. For the Atari to realise that it has a special meaning, it must be written in capitals, as must all other Basic words. For the moment, stay in capitals all the time – this will prevent you from falling into this error.

So far we have given the computer one instruction at a time, which it carried out immediately after we pressed Return (assuming we'd typed it correctly).

Sometimes, though, we want to give the micro a series of instructions and then tell it to carry them out. For instance, suppose we want the message:

PROGRAMMING
IS
EASY

to appear on the screen. With our step-by-step method, we would have used

PRINT "PROGRAMMING"
[Return]
PRINT "IS"
[Return]
PRINT "EASY"
[Return]

But, as you'll see if you try it, this doesn't produce the required effect, since each successive instruction spoils the layout.

We need to give the computer the instructions so that it:

1. Prints out PROGRAMMING
2. Prints out IS
3. Prints out EASY

in sequence, without stopping to ask us what to do next. Such a sequence of instructions is called a program. Notice also that the sequence is numbered – after all, the computer needs to know the order in which to

your CAPS on you won't fall error!

Start to write your own programs in PART TWO of MIKE BIBBY's guide through the micro jungle

carry them out.

Now let's write a program to print out

PROGRAMMING
IS
EASY

We were on the right lines with the first attempt, but this time, let's try numbering our instructions as we enter them.

First of all type:

NEW [Return]

NEW is a Basic keyword that clears out the computer's memory. If you don't do this the program you are typing in might get jumbled up with a previous one – you'll see more clearly how this can happen later.

You probably think that you haven't got a program in at the moment, but use NEW anyway, because it is possible that you might have entered a line or two by chance.

Then type:

10 PRINT "PROGRAMMING" [Return]

Notice two things:

- The first instruction is number 10, not number 1. In computing we tend to number our instructions in steps of ten for reasons that will become blindingly obvious later. We call the number of an instruction its line number.
- The computer didn't immediately carry out the instruction – it didn't print out PROGRAMMING after we pressed Return. This is because of the line number. It tells the computer that what follows isn't to be done immediately but is to be remembered for later as it is just one in a series of instructions. I'll prove that the computer actually does remember it in a moment.

Now type:

20 PRINT "IS" [Return]
30 PRINT "EASY" [Return]

What I'm going to ask you to do next should test your faith in me! Clear the screen by typing:

[Shift+Clear]

All your typing should have disappeared, but don't worry – your work hasn't been wasted. Because of the line numbers, the computer has kept a list of your instructions in its memory. To see the list, type:

LIST [Return]

and your program should reappear. We'll call it Program I:

```
10 PRINT "PROGRAMMING"
20 PRINT "IS"
30 PRINT "EASY"
```

Program I

An important point coming up now. We have entered a program (a numbered sequence of Basic instructions) into the Atari's memory and have got the computer to display those instructions with LIST. We have not, however, told the computer to do these instructions. It's like having written a shopping list – you still have to go out to the shops and turn your list into reality.

So to get the computer to actually do, or as we say, run the program in its memory, we type:

RUN [Return]

and, if we've typed it in properly, we should see printed out:

PROGRAMMING
IS
EASY

If you've managed it, congratulations on running your first program. (If not, don't worry, it's probably some simple error. List your program and look for the mistake. You might actually have a message telling you that there is an error in a particular line. What we're about to do next, although it assumes that you have been successful so far, will in fact show you how to correct your mistakes.)

Now let's try to alter our program so that it prints out:

PROGRAMMING
IS
SIMPLE

If you look back at the first program you will see that you need to alter line 30.

Changing line 30 couldn't be

→

simpler – just type in the new line 30, remembering to start with the line number 30, then press Return. The latest version will replace the old version in the computer's memory.

To demonstrate this, type:

30 PRINT "SIMPLE" [Return]

and then:

LIST [Return]

You should obtain Program II which is:

```
10 PRINT "PROGRAMMING"
20 PRINT "IS"
30 PRINT "SIMPLE"
```

Program II

An examination of this listing should reveal that the new version of line 30 has indeed replaced the old one. (Notice also that we didn't precede LIST with a line number – we wanted the micro to do it immediately.)

As a final proof that our amendment has been accepted, type:

RUN [Return]

You should now get the revised message.

If you accidentally typed line 10 as:

10 PINT "PROGRAMMING"

then, when you tried to run it you would get an error message.

To rectify such mistakes, simply retype the correct version of line 10 and press Return to enter it into the computer.

There are more sophisticated ways of correcting, or editing, a line, but they can wait for a while. For the moment we shall simply retype the line, with its line number, and press Return. Of course, if you notice a mistake while you are entering a line, use the Delete key to erase it, then continue typing from that point.

So far I have given you just two programs to run. However, using these as models, you can print out virtually any message you want on the screen. Just use line numbers in increments of 10, each line printing out part of the message you want out on the screen, by enclosing it in quotes after PRINT.

An important point about this series is that I'm going to give you lots of example programs to type in. Virtually all of them have two things in common:

- They make vital teaching points (otherwise they wouldn't be there in the first place).
- The output – that is, what appears on the screen – is trivial in content and in many cases there are far easier ways of doing it.

Programming is a skill like driving – you can only improve by doing it, not reading about it. Please carry out the examples, however silly or obvious they may seem to you.

Also, and this is far more important, I want you to go beyond the programs – try to alter, adapt and extend them, just to see what happens.

Adopt an experimental approach and a healthy scepticism for my pronouncements. If you are wondering whether something will work, go ahead and try it – you can't hurt the computer from the keyboard, so let your imagination run riot.

You'll learn far more from your own examples than you will by merely echoing mine. And the good thing is that you get such prompt feedback from a computer. If what you write isn't acceptable you'll soon get an error message.

So what I'd like you to do now is to spend a good time writing simple "message" programs for the computer to run. For some reason, in my experience in computing classes the messages tend to become quite scurrilous. There's one thing I've never been too sure of – is it slander or libel when it appears on a VDU?

Remember, type NEW before each new program, and use line numbers for each instruction. It's also good policy to LIST your program before you RUN it, just to make sure that all is as you intend.

Now suppose we wanted to alter Program II so that it printed out the message:

PROGRAMMING
IS
RATHER
SIMPLE

We need a line in there between 20 and 30 to print out RATHER. Well, 25 is a number between 20 and 30, so let's try:

25 PRINT "RATHER" [Return]

If you list it you'll see that the program has now become Program III:

```
10 PRINT "PROGRAMMING"
20 PRINT "IS"
25 PRINT "RATHER"
30 PRINT "SIMPLE"
```

Program III

So line 25 has "crept in" between 20 and 30. Even though we entered it out of order, the Atari stores it in memory in its correct numerical position. Try running the program as final confirmation.

This ability to insert lines into programs is the reason our line numbers go up in steps of 10 when we are writing programs – it leaves us plenty of spare line numbers in between for when we are patching them up.

Now enter Program IV:

```
10 PRINT CHR$(125)
20 PRINT "ATARI"
30 PRINT "USER"
```

Program IV

remembering to press Return after typing each line.

Now LIST it. Is there a phantom line 25 in there? If so, you didn't type NEW after the last program – the lines 10, 20 and 30 of the latest program have replaced those lines in the old program. But as the new program doesn't have a line 25, the old one remains to ruin your program. The moral is to use NEW before entering a new program.

If you have got an unwanted line 25, don't worry – you can easily get rid of it by typing:

25 [Return]

This will delete the line since you replace the old line 25 with a new line which contains nothing – which the computer then "forgets". This method holds good for deleting any line from a program – simply type out the line number, then press Return.

I'd better explain what line 10 does: It clears the screen. I don't want to devote much space to it here, so let's just accept it for the moment – we'll explain it fully later in the series.

You'll soon see that it works when you run the program.

Now let's try to print out our

message with blank lines between. We can use a line containing just PRINT to obtain a blank line, so Program V should do the trick:

```
10 PRINT CHR$(125)
15 PRINT
20 PRINT "ATARI"
25 PRINT
30 PRINT "USER"
```

Program V

Now try Program VI:

```
10 PRINT CHR$(125)
20 PRINT "HELLO";
30 PRINT "OUT";
40 PRINT "THERE"
```

Program VI

The output you will get is:

HELLOOUTTHERE

That is, each successive string is printed after the preceding one. The semicolon stops the next string being printed on a new line, "gluing" it to the end of the previous string printed.

Notice that since there are no spaces inside the strings, none appear between the words when they are printed out together.

Try to get the message to appear legibly by rewriting the program with appropriate spaces in the strings. Also notice that you can obtain the same output, far more simply, with Program VII:

```
10 PRINT CHR$(125)
20 PRINT "HELLO OUT THERE"
```

Program VII

However, as I said above, the programs I present to you are for making teaching points, which does not necessarily imply showing you the most efficient methods.

Experiment with joining up the output of successive PRINT statements with the use of the semicolon until you feel confident about it.

And now for something completely different.

Try running Program VIII. I think the effect is pretty impressive.

So far all our programs have

The ability to repeat a simple operation rapidly is what gives the Atari much of its power

```
10 PRINT "I"
20 PRINT "FEEL"
30 PRINT "DIZZY"
40 PRINT
50 PRINT
60 GOTO 10
```

Program VIII

merely copied back onto the screen what you have typed in. This program shows how, with the addition of one line (line 60), you can obtain a huge increase in the amount of output. It is this ability, to repeat a simple operation rapidly, that gives the Atari much of its power.

If things are happening a little too fast for you, you can temporarily suspend action by pressing:

[Control] + 1

This freezes the action until you press:

[Control] + 1

once more.

What is happening is that the computer follows lines 10, 20 and 30 and prints out:

I (line 10)
FEEL (line 20)
DIZZY (line 30)

followed by two blank lines. It then encounters line 60, which tells it to go back to line 10. It duly does so and prints out:

I (line 10)
FEEL (line 20)

and so on, until it reaches line 60, when it goes back to line 10 and so on ad infinitum. Notice that when the screen is full, it scrolls up to make more room.

Now the name for such a condition in a program, where you keep on repeating lines of code (as the program lines are known), is a loop.

We say here that we are in an unconditional loop because we haven't given the program any conditions for it to cease repeating itself. This is bad programming practice – compulsively introspective computers are not useful machines!

To stop such unconditional loops you have to interrupt them from "outside" by pressing the Break key. As you'll see, you get a message telling you which line the program stopped at.

If you want to have some fun with an unconditional loop, try Program IX. It repeatedly prints out an arrow composed of asterisks such as:

```
   *
  ***
 ****
*******
  ***
  ***
  ***
  ***
```

which will scroll upwards off the screen.

Finally, apart from its being an unconditional loop, which is always

```
10 PRINT "   *"
20 PRINT "  ***"
30 PRINT " *****"
40 PRINT "*******"
50 PRINT "  ***"
60 PRINT "  ***"
70 PRINT "  ***"
80 PRINT "  ***"
90 PRINT "  ***"
100 PRINT
110 PRINT
120 PRINT
130 PRINT
140 GOTO 10
```

Program IX

naughty, can you see what else is going wrong with Program X?

● *Next month we'll discover new ways to create programs.*

```
10 PRINT CHR$(125)
20 PRINT "THIS IS"
30 PRINT "VERY SILLY"
40 GOTO 10
```

Program X

130 XE:



Part of the new Atari generation

Assessed by ANDRE WILLEY

THE first Atari computers, in the days when Acorns were only found on trees, were revolutionary to say the least. The 400 and 800 – both initially with 8k and subsequently with a massive 16k – featured such undreamed-of features as 256 colours, multiple sprites and a four channel sound chip.

Four years later a much upgraded unit – the 800XL, boasting 64k, enhanced graphics and a new operating system – was released.

Now Atari has done it again with the extensively restyled 130XE. This 128k machine is based on the 800XL, so software written for that machine should work correctly on the new one.

Since the operating system is identical to that used on the 800XL the "Translator" program will still be required for those programs which used "illegal" routines on the old 400 and 800 computers.

The Translator can be loaded from cassette or disc before running any program which works fine on a 400 or 800, but won't work otherwise on an XL/XE machine.

The 130XE is one of a series of computers in the proposed XE range – some of which will possibly not be seen in the UK, in the near future at least.

The 65XE (a re-packaged 800XL) will probably not see daylight while the 800XL is still in the shops. The rumours say that the 8 bit portable 65XEP has been scrapped in favour of a 16 bit portable, and that the 65XEM music computer is in doubt too, since the 16/32 bit ST range will have Midi music interfaces built in.

Atari could neither confirm or deny this, but did confirm that currently all production efforts are being channelled into providing good stocks of the 130XE, and in getting ready for the launch of the new 520ST in May/June.

The XE range will support a whole host of new peripherals, including three printers and four disc drives varying in storage from 130k to 15mbyte capacity.

The disc drives will be driven by DOS 2.5, an upgrade of the old DOS 2.0. It will allow access to all of the new densities, the extra RAM of the 130XE and files from the abortive DOS 3.

The 130XE itself is a very sleek light-grey unit, looking similar to the keyboard portion of an IBM. The keys have a soft but positive feel and are slightly sculptured, which makes typing a joy.

The function keys (Start, Option, etc) now lie just above the main keyboard, somewhat disconcertingly for a previous Atari user.

I would have hoped that the System Reset button would have had a stronger spring than the others, as on the XL, but this has not been the case.

One interesting point is that the graphics symbols are now printed on the front of each key, making typing programs very much simpler.

The power switch is at the rear, adjacent to the socket which takes the transformer lead. Also provided on the rear panel are TV and video outputs, the serial bus connector for tape recorder, disc drives, printer, etc. and the re-sited cartridge and expansion ports.

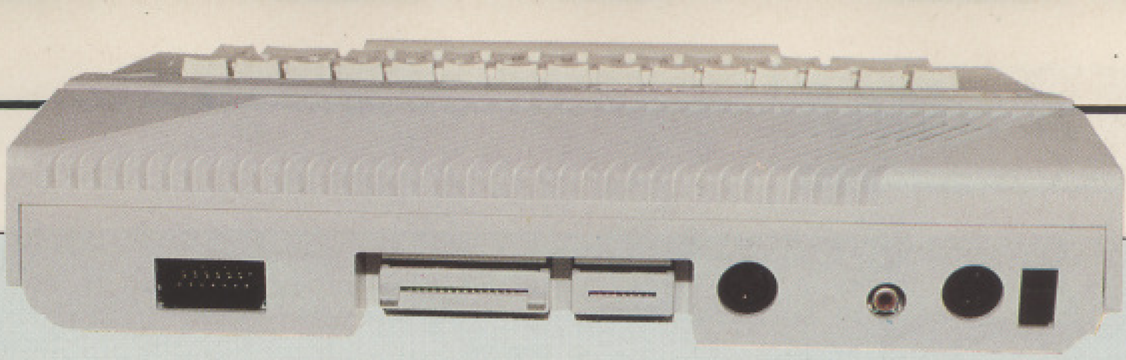
The XE will support all of the add-ons for the XL range using the serial bus, and although there is no parallel bus interface, the expansion connector along with the cartridge port provide a supposedly compatible alternative.

Thus expansions designed for the XLs will hopefully work on the XEs with little or no modification and vice-versa. Such is the theory.

Switching on, the machine behaves just like an 800XL. Basic will greet you with its "Ready" prompt and you may start to program, load games and so on.

The implementation is standard Atari Basic, although existing users will be glad to note that it is Revision C, the bug-free version.

It gives you, in addition to the normal Prints, GOTOs and FOR ... NEXT loops, commands to handle the 16 graphics modes and 256



colours, the four sound generators, long strings (up to 32k) and complex input/output operations.

Although this Basic is somewhat dated now, it is still a good match for Spectrum Basic, and is vastly superior to the CBM 64.

If you require a much more sophisticated Basic, don't despair – try Basic-XL from OSS. This provides structured programming, full sprite (player/missile graphics) control, advanced record handling and formatted PRINT statements, high speed memory access and transfer, full string handling, full error messages and much more.

It comes as an 8k cartridge and is upwardly compatible with Atari's own Basic – in fact it was written by the same programmers. This works fine with the XE, and provides so many useful features that since I received mine I have never used built-in Basic again.

The screen display is excellent with a normal TV and the graphics are sharper and more clearly defined than on the XL range. However I found that when used with a monitor, there were vertical lines over the whole screen and the colour saturation was very poor – giving a generally wishy-washy picture.

I hope that this was just a fault with my review machine, as Atari assured me, but I have heard stories of similar problems from some dealers.

My other gripe is the location and construction of the cartridge socket. It is very difficult to insert cartridges into the back of the machine, since you can't even see the socket without leaning over the computer. Also third-party cartridges have a tendency to wobble alarmingly. While this wasn't quite as bad as the famous Sinclair "Ram-Pack-Wobble" and it caused me no problems during testing with AtariWriter, Action!, Basic-XL and Atari Artist, it could well cause problems as the unit gets older.

I was, however, pleasantly surprised by the manual. It is well laid out and a good introduction into programming in Basic.

It clearly explains the keys and how to write simple programs, with examples throughout and a set of complete programs to type in at the end.

The appendices cover pin connections, accessing the extra RAM and Error messages. I feel that the book still doesn't go far enough and that some mention at least should be made of file handling (such as OPEN, CLOSE and X10), PEEKs and POKEs, ARRAYs, maths functions and the memory map.

Still, all credit to Atari for listening to the customers' complaints regarding the pretty little colour pamphlets which were enclosed with the XL instead of an instruction book.

Taking the cover off and looking inside, the main circuit board is actually quite spacious and superbly laid out. The number of chips has been reduced wherever possible, which should make for a very reliable machine.

All the chips are inside a metal shield, thus reducing interference. The keyboard itself is backed by a solid metal plate and there is no tendency to sag in the middle.

Perhaps Sir Clive Sinclair could get a hint or two about how computers should be made?

Unfortunately, the report in last month's issue that the XE would contain the new CMOS 65C02 chip was over optimistic and Atari has fitted the same CPU chip as used on the old XL range – the 6502C. This is a pity, but the difference would only be noticeable to a machine code programmer, anyway.

Overall, then, the 130XE is basically a 128k version of the 800XL, and is upwardly software compatible. The styling, keyboard and documentation have been vastly improved and let's hope that the rather minor video problems will soon be sorted out.

Still, at £169.99, it is a very good buy indeed, offering far more for the price than the equivalent CBM, Acorn or Amstrad offerings. I don't really think that the Spectrum is quite in the running.

How to use that extra RAM power

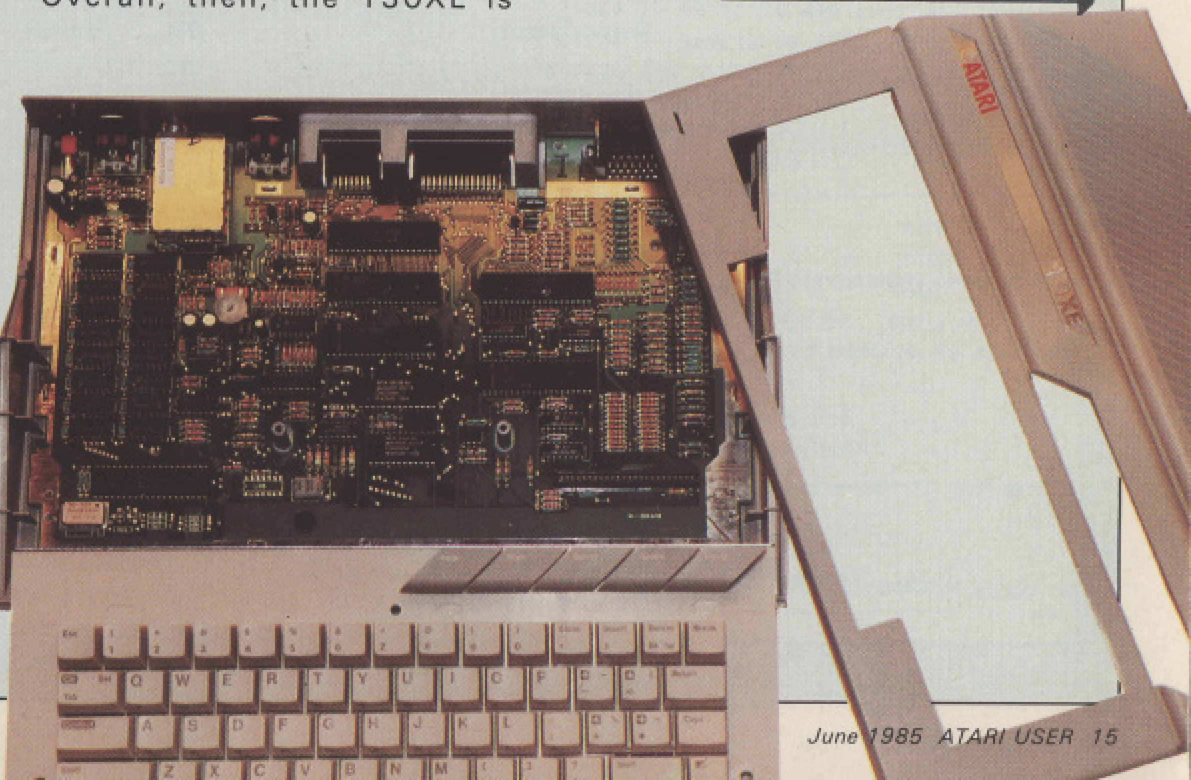
WHEN you power up the computer, typing:

```
PRINT FRE(0)
```

will print the number of bytes of memory available for your Basic program. This will normally read 37902 with nothing else loaded. This is about 37k, so what's all this about 128k?

Well, the 6502 chip, or Central Processing Unit (CPU), which does all of the hard work inside your machine, can access a maximum of 64k of memory at once. *(But the book said 128k...).*

This means that within that 64k memory must be the operating system (16k), Basic itself (8k), your text display (1k), various special information and pointers required by the OS and Basic (just under 2k). You



can put your program in the 37k that's left. *(But what about . . .).*

However, there is a loophole that Atari has exploited in the 130XE. The 6502 can access up to 64k at a time. Why not, for instance, have two sets of 64k, storing your program in one set and perhaps data or display information in the other? This is basically what has been done.

We must always leave the operating system intact for programs to function correctly – that means leaving 48k to 64k well alone. Also, if we are using Basic then the area from 40k to 48k containing Basic itself must be left intact.

Screens will normally be in the 32k to 40k area, although we can change this to our advantage *(see program listing on next page).*

Your Basic program will start at about 2k, which leaves a nice block from 16k up to 32k or $4000 to $7FFF in hex, relatively free.

You can tell the computer to use either the "normal" $4000-$7FFF memory, or one of four other "hidden" blocks inside the machine. Four lots of 16k being the extra 64k, of course. Let's see how it works in practice.

In Table I you can see the eight blocks of memory available for use and how they are allocated – think of them as two sets of four blocks. You may tell the computer that whenever you access memory between $4000 and $7FFF, you really mean to talk to one of blocks 0, 1, 2 or 3.

This will allow, for instance, a program that extends throughout most of the 37k free memory to "switch off" its middle portion and "switch on" an empty block of memory. You may then manipulate data, set up screens, or anything else you wish within that area.

After you have finished working with the extra block you give another POKE and your Basic program is back intact.

By the way, DO remember to make sure that you don't want to use any lines of program that may be in that middle block while you've got it switched off! This would cause a disaster and Basic would probably crash or lockup.

The safest way is to write a small routine at the start of the program to handle the memory switching and usage, then GOSUB to it whenever you want to use the additional

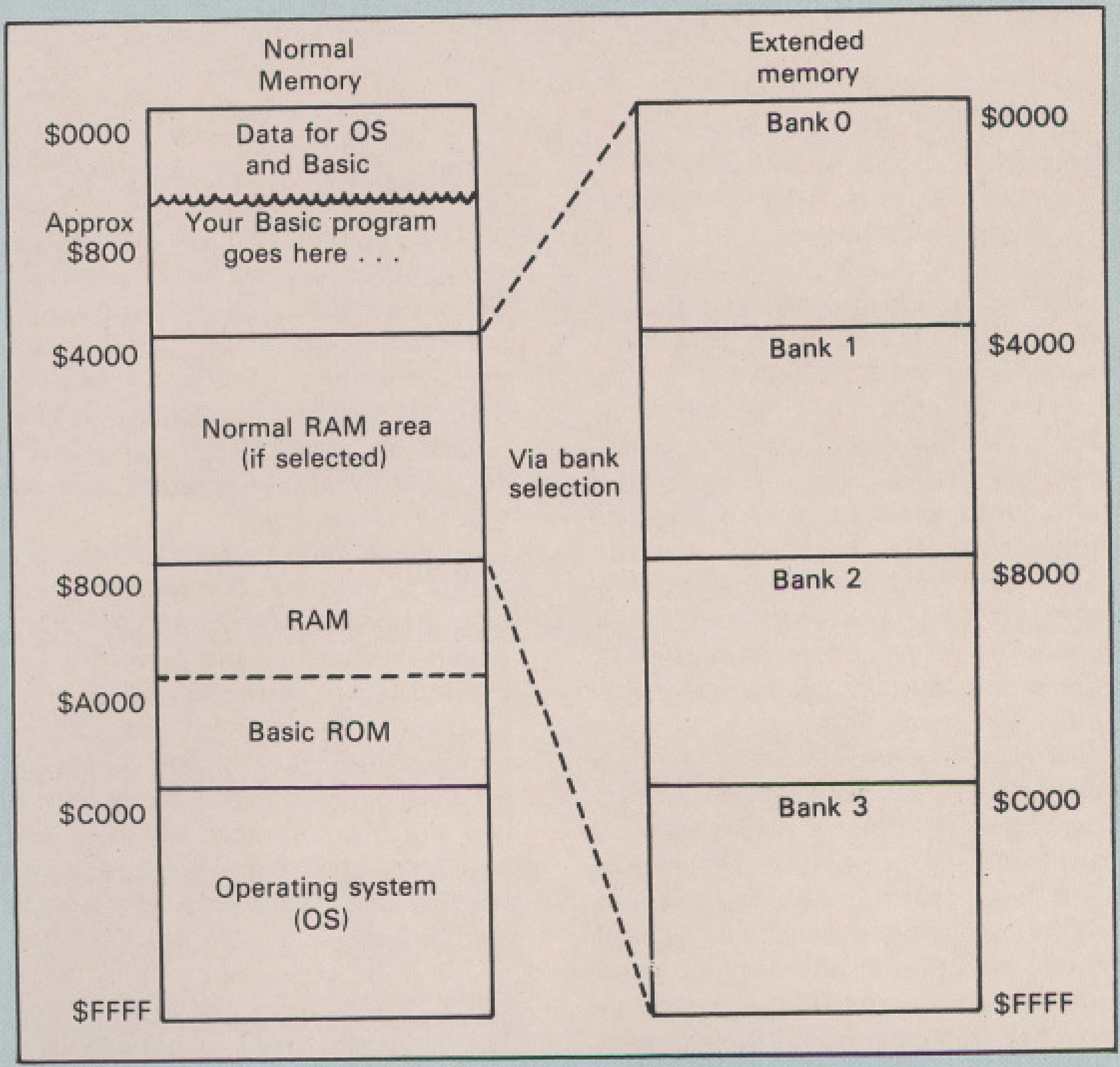


Table I: Memory allocation

Bit	Value	Description
*0	1	Operating system select 1 = Operating system ROM enabled at $C000 0 = RAM enabled at $C000
*1	0 from Basic, 1 from m/code	Basic ROM select 1 = RAM enabled at $A000 0 = Basic ROM enabled at $A000
2	1	Memory bank select bit 0 (See text for full description) (Named: BA0 – LSB of secondary bank address)
2	1	Memory bank select bit 1 (See text for full description) (Named: BA1 – MSB of secondary bank address)
4	1	CPU bank enable (CBE) 1 = 6502 uses Normal memory bank at $4000 0 = 6502 uses Extended memory bank at $4000
5	1	Video bank enable (VBE) 1 = Antic uses Normal memory bank at $4000 0 = Antic uses Extended memory bank at $4000
*6	1	Reserved for future use (Unused on the 130XE)
*7	1	Self-test ROM select 1 = RAM enabled at $5000 0 = Self-test ROM enabled at $5000

** Don't change these bits unless you know what you're doing*

Table II: Use of memory location 54017 ($D301)

memory *(see example program).*

So far we have treated this switchable bank of memory as being simply normal memory, or one of four other extended blocks of memory. In fact, just to make the whole issue more complicated, it can be both at the same time.

This is not quite as daft as it sounds, and is easier to understand if you remember that an Atari actually has two, not one, CPU chips. The 6502 is the main one, which does all of the work for Basic and input/output.

However, there is a second processor called Antic which is solely devoted to generating the screen display. This also accesses memory in order to do its job. You can tell Antic and the 6502 to access different banks of memory.

For example, in the above case, if you wanted to use the Basic program at $4000 while you were displaying a screen from bank 1, you couldn't. But by telling Antic to use bank 1 for its display, and the 6502 (which handles Basic programs, remember?) to use normal memory, you have accomplished both tasks at the same time.

You can't of course tell the CPU to change the display data while you're in this mode – it doesn't see the same memory as the display chip.

This means that any graphics commands, PLOTs and DRAWTOs, etc., must be done when the CPU is accessing the memory containing the screen data, and the middle of the Basic program is switched off. You can still use SETCOLOR, though, which doesn't actually change the contents of the display area.

One memory location is used to control all of the switching. This is location 54017 ($D301 for machine code users). Each individual bit within that location does a different job, as described in Table II (see last month's Bit Wise article if you're not familiar with bits and bytes).

Bits 1, 7 and 8 must always be 1, and bit 1 must be 0 (from Basic; that is – do what you like from machine code, but remember to take over system control from the OS before you switch it off). This gives a base value of 128+64+1 (or 193) to POKE into 54017. The extra bit values to add on are worked out as follows.

Bits 2 and 3 tell the computer which of the four alternative blocks to use. Bit 4 tells the 6502 CPU to use either Normal or Extended mode (that is normal memory, or the extra block selected by bits 2 and 3). Bit 5 tells Antic whether to use normal or extended memory for its display (assuming Antic wants to use the 16k – 32k area, that is).

Thus, for:

- Bank 0, add 0 to the POKE,
- Bank 1, add 4 to the POKE,
- Bank 2, add 8 to the POKE,
- Bank 3, add 12 to the POKE.
- CPU 'Normal' Mode: add 16 to the POKE,
- CPU 'Extended' Mode: add 0 to the POKE.
- ANTIC 'Normal' Mode: add 32 to the POKE,
- ANTIC 'Extended' Mode: add 0 to the POKE.

To set the memory usage, use:

```
POKE 54017,193 + (Bank Select
Code) + (CPU Mode) + (ANTIC Mode)
```

To re-set the memory back to normal, use:

```
POKE 54017,193+12+16+32
```
or
```
POKE 54017,253
```

Example 1: To set the CPU to 'Normal' memory, and ANTIC to Bank 0:

```
POKE 54017,193+0+16+0
```

Example 2: To set the CPU to Bank 1, and ANTIC to 'Normal' memory:

```
POKE 54017,193+4+0+32
```

Example 3: To set the CPU and ANTIC to Bank 3:

```
POKE 54017,193+12+0+0
```

You will quite quickly get used to working with location 54017 as a matter of course, and it is far easier to use and more versatile than trying to get at the extra 16k on the 800XL.

If anyone finds any interesting applications for the extra memory write in or send a listing of your program.

Above all, don't be afraid to experiment. Once your program is saved, no matter what you do to the memory you can always switch off and start again if things go wrong. Have fun!

(My special thanks to Software Express, of Birmingham, for the kind loan of the very first 130XE in Brum.)

Example program

This program can only be used on a 130XE computer. If you haven't got one, add the line:

```
205 RETURN
```

or try using the pattern drawing routines seperately to see some pretty displays.

Type in the listing, check it is correct, and SAVE it. When you run it a pattern will quickly be drawn. This will be left on the screen while the computer draws more patterns in other banks of memory (the screen will flash to let you know it's still working).

Once the screen has stopped flashing press keys 1 to 5 to view the pictures. Press Esc to stop the program. Try not to use Break to stop it, as you will confuse the computer into displaying the wrong screens, giving strange rubbish all over the screen.

You may experiment with the five pattern-drawing sections. Try changing some of the numbers in the loops to get different patterns. Start by setting one of the FOR I=1 to 360 loops to a step value of 30.

```
130 REM
140 REM
150 GOTO 320:REM Jump to main program
160 REM
170 REM
180 REM ****************************
190 REM
200 REM SUBROUTINE to select memory Ba
nk.
210 REM
220 REM Test for valid values - or we
might crash the system!
230 IF CPU<>0 AND CPU<>1 THEN END
240 IF ANTIC<>0 AND ANTIC<>1 THEN END
250 IF BANK<0 OR BANK>3 THEN END
260 REM Set VBE, CBE & Mode bits in PO
RTB
270 POKE 54017,193+(CPU*16)+(ANTIC*32)
+(BANK*4)
280 RETURN
290 REM
300 REM ****************************
310 REM
320 REM Tell the computer to put scree
ns below 32K
330 POKE 106,128:DEG
340 REM
350 REM Set normal memory, and draw a
pattern
360 REM
370 LET CPU=1:ANTIC=1:BANK=0:GOSUB 200
```

→

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VARIABLES

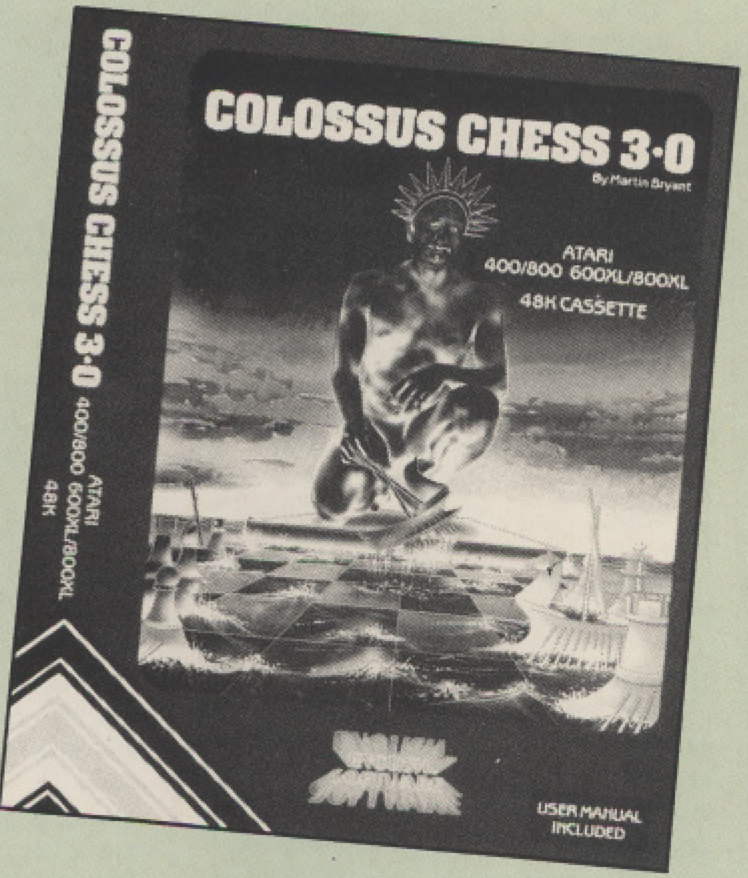
CPU	Sets CPU mode for subroutine at 200.
ANTIC	Sets Antic mode for subroutine at 200.
BANK	Sets Bank number for subroutine at 200.
I	Angle value for graphic drawing loops.
J	Repeat value for graphics drawing loops.
CH	Ascii code of last key pressed (if valid, converted to a number between 1 and 5).

FUNCTIONS

150	Jumps past subroutine.
200-280	Check values, and set bank select. Could be re-used for your own ideas. Just set variables Antic, CPU and Bank, and GOSUB 200.
330	Sets screen to 32k and does patterns in degrees.
370-410	Set normal memory and draw pattern 1.
470-550	Set CPU to Bank 0, leave Antic on normal memory and draw pattern 2.
610-690	Set CPU to Bank 1, leave Antic on normal memory and draw pattern 2.
730-830	Set CPU to Bank 2, leave Antic on normal memory and draw pattern 3.
890-980	Set CPU to Bank 3, leave Antic on normal memory and draw pattern 4.
1010	GOSUB to set colours.
1070-1120	Get a key. If 1-5, GOSUB accordingly, if Esc, exit to Basic. Otherwise get another key.
1170-1190	Set Antic and colours for picture 1.
1240-1260	Set Antic and colours for picture 2.
1310-1330	Set Antic and colours for picture 3.
1370-1390	Set Antic and colours for picture 4.
1440-1470	Set Antic and colours for picture 5.
1520-1530	Subroutine 1 to set colour registers.
1580-1590	Subroutine 2 to set colour registers.

```
380 GRAPHICS (31)
390 FOR I=0 TO 360 STEP 5
400 COLOR I/10:PLOT 80,95:DRAWTO SIN(I
)*79+80,COS(I)*90+95
410 NEXT I
420 REM
430 REM ****************************
440 REM
450 REM Set bank 0, and draw a pattern
460 REM
470 LET CPU=0:ANTIC=1:BANK=0:GOSUB 200
480 GRAPHICS (24)
490 COLOR 1:FOR J=1 TO 90 STEP 5
500 POKE 712,PEEK(20):REM FLASH BACKGR
OUND...
510 PLOT SIN(J)*J*1.3+160,COS(J)*J+95
520 FOR I=0 TO 360 STEP 60
530 DRAWTO SIN(I+J)*J*1.3+160,COS(I+J)
*J+95
540 NEXT I
550 NEXT J
560 REM
570 REM ****************************
580 REM
590 REM Set bank 1, and draw a pattern
600 REM
610 LET CPU=0:ANTIC=1:BANK=1:GOSUB 200
620 GRAPHICS (31)
630 FOR J=1 TO 75 STEP 3
640 POKE 712,PEEK(20):REM FLASH BACKGR
OUND...
650 COLOR J/2:PLOT 80,J+95
660 FOR I=0 TO 360 STEP 60
670 DRAWTO SIN(I)*J+80,COS(I)*J+95
680 NEXT I
690 NEXT J
700 REM
710 REM ****************************
720 REM
730 REM Set bank 2, and draw a pattern
740 REM
750 LET CPU=0:ANTIC=1:BANK=2:GOSUB 200
760 GRAPHICS (24)
770 COLOR 1:FOR J=1 TO 95 STEP 5
780 POKE 712,PEEK(20):REM FLASH BACKGR
OUND...
790 PLOT SIN(J*2)*J+160,COS(J*2)*J+95
800 FOR I=0 TO 360 STEP 90
810 DRAWTO SIN(I+J*2)*J+160,COS(I+J*2)
*J+95
820 NEXT I
830 NEXT J
840 REM
850 REM ****************************
860 REM
870 REM Set bank 3, and draw a pattern
880 REM
890 LET CPU=0:ANTIC=1:BANK=3:GOSUB 200
900 GRAPHICS (24)
910 COLOR 1:FOR I=0 TO 317 STEP 2
920 POKE 712,PEEK(20):REM FLASH BACKGR
OUND...
930 PLOT I,95:DRAWTO I,SIN(I*2)*80+COS
(I*20)*10+95:PLOT I+1,SIN(I*2)*90+95
940 NEXT I
950 PLOT 0,95:DRAWTO 319,95
960 FOR I=10 TO 310 STEP 20
970 PLOT I,90:DRAWTO I,100:PLOT I+1,90
:DRAWTO I+1,100
980 NEXT I
990 REM
1000 REM Set colours...
1010 GOSUB 1570
1020 REM
1030 REM ****************************
1040 REM
1050 REM Get character from Keyboard
1060 REM
1070 OPEN #1,4,0,"K:"
1080 GET #1,CH
1090 IF CH=27 THEN POKE 54017,253:POKE
 106,160:END :REM Press 'ESC' to end
1100 CH=CH-48:IF CH<1 OR CH>5 THEN 108
0:REM If key wasn't valid, get another
1110 ON CH GOSUB 1160,1230,1300,1370,1
440
1120 GOTO 1080:REM Get another key
1130 REM
1140 REM ****************************
1150 REM
1160 REM Picture 1
1170 ANTIC=1:GOSUB 200
1180 GOSUB 1570
1190 RETURN
1200 REM
1210 REM ****************************
1220 REM
1230 REM Picture 2
1240 ANTIC=0:BANK=0:GOSUB 200
1250 GOSUB 1510
1260 RETURN
1270 REM
1280 REM ****************************
1290 REM
1300 REM Picture 3
1310 ANTIC=0:BANK=1:GOSUB 200
1320 GOSUB 1570
1330 RETURN
1340 REM
1350 REM ****************************
1360 REM
1370 REM Picture 4
1380 ANTIC=0:BANK=2:GOSUB 200
1390 GOSUB 1510
1400 RETURN
1410 REM
1420 REM ****************************
1430 REM
1440 REM Picture 5
1450 ANTIC=0:BANK=3:GOSUB 200
1460 GOSUB 1510
1470 RETURN
1480 REM
1490 REM ****************************
1500 REM
1510 REM Colours for GR.24 screens
1520 SETCOLOR 2,12,10:SETCOLOR 4,12,4:
SETCOLOR 1,0,0
1530 RETURN
1540 REM
1550 REM ****************************
1560 REM
1570 REM Colours for GR.31 screens
1580 SETCOLOR 0,3,8:SETCOLOR 1,8,10:SE
TCOLOR 2,12,6:SETCOLOR 4,0,0
1590 RETURN
1600 REM
1610 REM ****************************
```

Well-named Colossus



ENGLISH Software are not what you'd call modest about their **Colossus Chess 3.0** package. In all their literature, and even in the manual, it's billed as "the best chess playing program for Atari computers".

Maybe that only makes it a big fish in a small pool, because there aren't that many alternative chess programs for the Atari.

However, before I see how it would fare in the bigger pool that includes other micros, let's look at what if offers.

I was glad to see that the program allows you to use a cursor to specify your move. You simply position it on the piece to be moved, press Return, position it on the square to move to, and press Return again.

I find this much easier than the more common "e2-e4" format. However, if you *want* to do it that way, the program will allow it.

As chess programs go this one is very comprehensive. I'll consider its standard of game later, but the extent of its features is very impressive.

An enormous variety of levels can be selected by varying the amount of time the program has to select a move.

Full tournament mode can be selected or you can play an all-the-moves game in which the total game time is specified.

You can even introduce a handicap for the program (or yourself if you're that good) by putting some time on one of the clocks before the game starts.

There's an "equality" mode in which the program will try to keep its clock as close as possible to your own, so if you can move quickly you can force the program to do the same.

There are plenty of other features too, like the replay facility enabling you to see how the game got to its present state. A useful tutorial feature is the "legal moves" option which will show all such moves for any piece selected.

The program can also be used to set up and solve chess problems, and not just the usual "white to move and mate black in five moves" type.

It claims to be the first home computer chess program ever to be able to solve selfmates and helpmates, and as far as I know the claim is true.

On features alone then, it's probably fair to say that Colossus is the best chess program available for the Atari.

The manual gives a good description of all the features and how to use them, and fully describes all the different sections of the screen display.

In fact there's only the manual that I found to criticise. The content is fine, but the presentation is awful. It's printed in black on red paper – not a pretty sight.

It looks to have been photo-reduced to A5 size from A4 dot matrix printer output, which doesn't help, and you'll need a magnifying glass to read the loading instructions.

To consider whether the program is anything more than a big fish in a little pool we need to look at the standard of its game.

Rather than describe in detail how the program tore me to shreds, which doesn't say much, there's a table at the end of the manual which gives the results of Colossus v The Rest.

The program was tested against over 20 other programs on a variety of machines ranging from the ZX81 to the Apple. Against each one a series of 16 games was played on various levels with an equal number of whites and blacks for each program.

Colossus beat them all – most of them by 16 games to nil. Sargon III, widely recognised as an excellent program, went down 10-6. Parker Chess, another Atari version, went down 12-4, while Atari's own version lost 16-nil. White Knight Mk II won only three of its 16 games.

About a year ago Colossus Chess 2.0 for the Commodore 64 was advertised as "the finest chess program ever written". I'd have been interested to see how 3.0 fared against its predecessor.

Since both were written by Martin Bryant we can assume that 3.0 would win . . . but by what margin? How much improving can he do?

As the manual points out, the same set of results could not be guaranteed in every set of 16 games. Nevertheless, even if the results are taken as only a rough guide, they show Colossus to be up there with the best of them.

Colossus Chess 3.0 comes on 48k cassette or disc, with prices of £9.95 and £12.95 respectively. To call it the best chess program for the Atari might just be damning it with faint praise!

Dave Russell

One for joystick jockeys

AS they say on all the best awards shows, "I'll take them in reverse order". Last month we reviewed Smash Hits volumes 3 and 2, this month I'll look at Volume 1.

Like the other two volumes, it opens with **Jet-Boot Jack.** This is probably the best known of the English Software games, which is presumably why they include it on all three volumes. It's a good game, so I'm not complaining.

Next is **Dan Strikes Back,** the sequel to Diamonds from Volume 2. English Software

obviously watch the same awards shows. Once again Dan sallies forth (or rather down) with his spade as he digs his way to the diamond on level 6. Of course Brian the Blob and a variety of other nasties are out to stop him.

For my money this is miles better than the original. It's been a smash hit in our household – we've played it for hours and nobody's got beyond level 5 yet.

Next comes **Hyperblast,** which is exactly what you'd expect a game of that name to be. If it moves, blast it!

These sort of games are great if you like them, and I usually do in moderation. Hyperblast will give your joystick and thumb plenty of exercise as you dodge the enemy, although it has the wimpiest space warp I've ever seen. Still, you only warp between levels so the quality of play isn't affected.

In **Captain Sticky's Gold** you play the part of the captain's hapless crew member who gets to dive for the gold. Level 1 starts off nice and easy, with only some fish and an air leech to avoid while you're grabbing the gold.

Of course your oxygen is being used up all the time you're under water. You can replenish your tanks by resurfacing, but there is also a time gauge which shows how long you have left to complete the level.

When you've collected 10 bars of gold you move to the next level, where things are a little harder. If you can complete eight levels you move to the next difficulty zone.

If Hyperblast is for the arcade addict, Captain Sticky's Gold starts off simple enough for the novice or the younger members of the family.

Finally, **Firefleet** calls for arcade reactions with a high level of precision. Your task is to steer your space cruiser through a series of canyons populated by tanks. It's a sort of vertical Airstrike, with the scrolling being really well done.

I found it a bit strange at first because the scene scrolls from bottom to top, giving the impression of downward motion. Most other games scroll in the other direction.

The game requires a bit of strategy, a fair amount of selective shooting, and a lot of precision steering. If you hit the wall you're dead, and sometimes there's not much room. Fortunately, response to the joystick is excellent.

Firefleet is a difficult game – it took me a few minutes to get *anywhere* – and the frustrating thing is that you are returned to the beginning when you get killed off. If you like a challenge, this one's for you.

All in all, if you're a joystick jockey then Volume 1 is good value for money at £14.95 for the tape and £17.95 for the disc.

Pat Cookson



KEEP AN EYE OPEN FOR LUIGI

ONE of the features of the new Atari disc package is the inclusion of a new adventure game, **The Pay-Off.** Fortunately for this reviewer, who already owns a complete Atari system, the game is also available in its own right from "all good Atari stockists".

The game is a double first for Atari, being both their first disc game and also their first adventure. Based on this worthy effort, we can only hope that it won't be their last.

Despite the recent trend towards graphic adventures, Atari chose to launch a text-only game, billed in publicity as "an adventurers' adventure". This may be seen in some quarters as Atari once more swimming against the tide, but the brain is mightier than the pixel, as any real adventurer will assert.

You start out as a small time hoodlum determined to stake your last few dollars on a hopeless nag, a rank outsider that only an out-and-out loser would back. Unfortunately, as you quickly discover, Luigi, in whose seedy betting shop you stand, is in no mood to extend your credit. In fact he's calling in your marker, and boy does he mean business!

Leaving the shop, forcibly if needs be, the threat of a quick trip to the bottom of the river ringing in your ears, you begin a search for some quick cash – 40,000 greenbacks to be exact.

The lack of immediate exits soon had me climbing the wall, but the writers were one jump ahead and the real route to success was nothing more than a pipe dream.

Once over these initial obstacles I soon found plenty of real life places to explore and objects to use. I also discovered a malevolent sense of humour lurking beneath the surface. Just try climbing the fence in the car park.

In fact I found myself more and more saving my game position and deliberately "dying" in order to enjoy the author's sense of humour.

The beauty of this adventure is that the more you think yourself into the character the easier it is to solve the various problems. A desperate situation calls for desperate measures, and at least two of the obstacles which confront you require a degree of violence to overcome them. Not too much though, or you will provoke a swift reprisal.

The game has several distinct phases, ranging from "What on earth am I supposed to be doing?" which is not entirely clear at the outset, to a phase where everything is proceeeding in a straightforward manner.

This leads the unwary adventurer to think that the solution to the game is a fairly obvious one. Many objects and places are found which lead the villain of the piece, you, to the rear of the Bank of New Jersey in search of a fabulous gem which, word on the street has it, could be the answer to all your problems.

Yet the greatest crime has been perpetrated (intentionally I might add) by the programmers, who have allowed the adventurer just enough rope to hang himself.

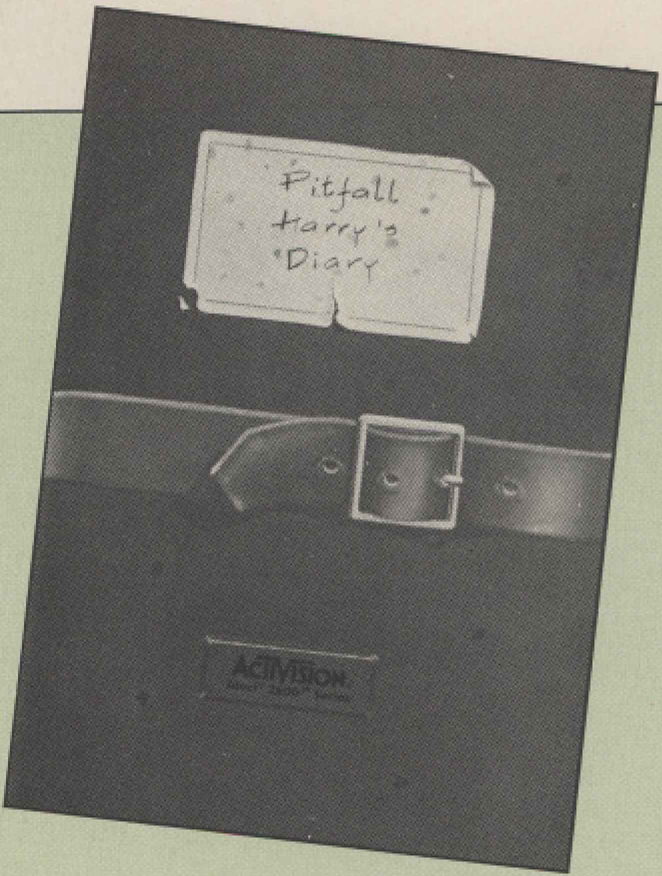
While it is possible to gain access to the bank – and to explore it, despite the dozy guard – one very important piece of equipment is secreted where only the most persistent adventurer will locate it without difficulty. In fact, you've been framed!

The problem with reviewing an adventure such as The Pay-Off is that the game revolves around solving problem after problem, each new success allowing more of the adventure to reveal itself.

It exudes a unique atmosphere so essential in preventing such games from becoming mere exercises in problem solving, and yet to allude to solutions too obviously is to spoil that feeling. Suffice it to say that the game left this adventurer peering warily over his shoulder for any sign of Luigi and his boys as he crouched at the vault door, preparing his last drill bit.

Eric Gibson

A micro version of Indiana Jones?



PITFALL II from Activision is a follow-on from their original Pitfall game. And what a follow-on it is – a levels-and-ladders game with extra surprises.

The first surprise came in the form of an instruction booklet in French, German, Italian, Spanish and Dutch.

Not a mention of English – but from my skimpy knowledge of French I managed to establish that you move Harry around (a sort of Micro Indiana Jones), searching a huge underground cavern for his niece, Rhonda.

You must also find his pet cat, Quickclaw, a Raj diamond and a stone rat.

Collecting gold bars on the way to boost your points score seems to be the least of your worries.

The quest starts on a red cross at the edge of a forest and as you progress to the cave you start to meet the enemy – the most vicious bunch of creatures that you could ever hope to set eyes on.

They take the form of frogs, ducks, bats and scorpions to name but a few, and they're all out to make life extremely unpleasant for you.

On the first level the frogs do their utmost to prevent you going down ladders to the next platform.

The bats and ducks are out to stop you in your tracks by flying across the screen with your head as the prime target, while the scorpions are continuously attracted to your nether regions for the same reason.

This is certainly not a game for the faint-hearted.

At the bottom of the cave there is an underground river full of different nasties, but to collect all the gold bars you must take your chance with these sooner or later.

You can in fact end up taking an unexpected ducking by misjudging some of your earlier leaps. There's no harm done, though, as our hero is an excellent swimmer with a mega lung capacity.

I'd keep an eye open for the eels, though – they've a few shocks in store.

In another part of the cave a waterfall cleverly conceals one of the gold bars and you can only get at it by hitching a lift on a passing balloon. A quick grab for the rope and it's up, up and away.

And it's here that those infernal bats turn out to be a blessing in disguise.

If you can manoeuvre the balloon into the path of one of them, the balloon bursts and you drop off on the ledge below.

Your ultimate target, a gold ring, can only be accessed by a well-judged death-defying leap from one of these ledges to a small platform halfway down the cave.

Success automatically transports you to level two, which is a larger cave with more meanies and, I suspect, more gold bars and other treasures.

I say suspect because, as yet, I haven't been able to get any further. It's got something to do with the piranhas and giant ants – different hazards to contend with on this level.

Contact with any of these, as well as the earlier nasties, results in your return to the last red cross you walked over, and you lose some of your points.

One thing you don't lose, though, is your life, and this means the game can last as long as you want it to.

A catchy tune plays throughout – quite entertaining in its own right. However, I was a little disappointed with the graphics, as I don't think they use the Atari's capabilities to the full.

And the game only supports joysticks, which is a shame and obviously rules out a lot of Atari-owners who can only access the keyboard.

Minor gripes apart, the game is extremely addictive, great fun to play, and the number of levels to come will remain a mystery to me until I get some more practice.

David McLachlan

OUTDO THOSE GREMLINS



ALL is peaceful in the garden. In this US Gold offering, **Mr Do** is going about his normal business harvesting the cherries when from behind a toadstool a hideous beastie suddenly rears its ugly head.

Can our hero outrun it? Will this year's cherry harvest be in ruins? Will Mr Do end up caught by the gremlins?

You move Mr Do around the garden in an attempt to collect all the cherries. As you move through the long grass you clear a path behind you.

The gremlins, bless 'em, appear at regular intervals from a central toadstool, and normally travel along the clear pathways in hot pursuit.

You can outrun them for a while but when things get tough, and believe me they will, you can always send your crystal ball zig-zagging along the pathway in an effort to dispose of them.

Scattered around the garden are several large apples, and by clearing a path underneath them you can make them drop, hopefully onto any meanie that you've managed to entice underneath.

If your luck's anything like mine you'll finish up squashed more often than the meanie.

If you're feeling brave you can always try an all out assault on the central toadstool to gain extra points.

This is an extremely addictive game, great fun to play, and is a must for the repertoire of any serious arcade addict.

Paul Hewitt



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THE U.S. TOP 10 HIT THAT BECAME A CULT
STAR GAME
ARCHON is brilliant. There's something in it for all games addicts; arcade, adventure and strategy are all here. My only complaint is that it's best played against a human opponent – the computer's just too good and you can't give it a handicap.
Bryan Skinner
Personal Computer News
ARCHON from Electronic Arts
THE LIGHT AND THE DARK
A strategy program for the COMMODORE 64 U.S. TOP 10 HIT
ariola
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Features ● Play the computer or a friend ● Computer player gets tougher as you do ● 64 Battle combinations ● Separate battleground screen ● Medieval pieces like the wizard and the sorceress – magic spells and a board that changes as you play ● Deluxe boxed package includes full instruction and hints manual ● Joystick controlled *
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Find out how to use your Atari to link up with the world network of communications in this special 12 page section

Hooked on hacking

PETER ATKINSON confesses his communications addiction!

DO you remember the days when you got your first Atari? It was love at first sight, wasn't it? Those rapturous hours at the keyboard, those agonies of frustration coupled with the mind-bending moments of triumph when you actually got the thing to do something.

Happy days, or at least they were for me. Still, like all infatuations it gave way to a more mundane love-hate relationship. Micros were still exciting, but the first thrills had gone, never to be recalled. At least that's what I thought until I was introduced to the world of comms. Then that was it. Gone was the debonair, "man of the micro world", "I can take Ataris or leave them" attitude. I was hooked, demented, crazed. I'd joined the hacking fraternity!

If you're wondering what comms means, it's short for communications – in this case, communications between micros via the telephone lines. It sounds so innocent, doesn't it? Then I suppose heroin doesn't look too bad, but once you get hooked . . .

It started when a friend of mine who works for *Atari User* lent me a modem – that's the gadget for attaching a micro to the phone system – and his black book of bulletin board numbers.

A bulletin board is just an electronic noticeboard that you can leave messages on. And, of course, you can scan the messages other users leave.

It appears innocuous enough, doesn't it? But it's not. From my first session I was in its grip.

The messages are absolutely fascinating. There are people asking for (or supplying) help with programming problems, people swopping their experiences with various software packages (especially adventures), people airing their opinions on everything from politics to piano playing.

There are second-hand and swap pages – everything from cars to wives, pages of micro-news, gossip . . . the list goes on and on. I've even seen jobs advertised.

In my quieter, reflective moments (when the wife insists on using the phone) I think the attraction is the fact that microcomputing is normally such a lonely business.

As soon as you get into comms you're freed from your isolation. It's amazing how many interesting, like-minded fellow maniacs there are out there!

And then there's the free software. Most bulletin boards have software for downloading, as it's known.

A lot of it is excellent quality – and it's free! Even if I've no need for it I can't resist having it. The boards also carry the phone numbers of other boards, which carry numbers of yet other boards . . . and so on ad infinitum.

Of course, as with all addictions, you move on to harder stuff. My encounters with bulletin boards led inexorably onto flirting with Prestel. No hobbyist bulletin board this, but a nationwide commercial network based on a series of powerful mainframes.

It's got screenfuls of information, latest news, special interest groups and software to download – although this time you have to pay. (My habit was getting serious by now.)

Still, you can get everything from train timetables to holiday bookings, electronic shopping to interactive adventure games. You can spend days on Prestel (I did) and not exhaust the possibilities.

And then I discovered Telecom Gold. It's not a dairy product, no matter how it sounds. It's an incredibly sophisticated electronic mail system, a sort of mega-bulletin board.

I was lucky to get in at the beginning of MicroLink, one of the latest developments on Gold, as afficionados refer to it. This is a joint development between Telecom Gold and the people behind *Atari User* and promises to be the most addictive comms source yet.

For a start, everyone gets their own electronic mailbox. If, like me, you can't wait to open your mail in the morning, you'll enjoy logging onto the system (as ringing it up is known). There's a fresh crop of letters every few hours.

When I first logged onto it, MicroLink was in the development stage, so there were only magazine editors and the like to write to. By the time you read this, though, there should be hundreds of real people sharing the fun.

Mind you, MicroLink isn't just restricted to sending letters to people, although there are extremely powerful facilities for doing so I haven't even touched on.

There's a notice board and a more powerful bulletin board. You can chat with anyone who happens to be "on-line" to the computer at the same time as you are. You can find out which dealer's selling the equipment you want at the price you want. The list of facilities goes on and on.

How could I resist? The truth is I didn't even try. Every spare minute I get I'm on the Atari communicating! I suppose really I should start moralising:

Go mother, tell your children,
Never do what I have done

Or suggesting that every modem should have a government health warning.

Perhaps I should . . . but I won't. Comms is just too much fun.

Get your across bulletin

PETER TOOTILL explains the advantages of using your Atari computer for interactive communication

ONE of the most interesting of modern methods of communication is the bulletin board system – often referred to as a BBS.

So what is such a system? The idea started in the USA, when a computer club decided that pinning messages to other members and notices onto a cork board on the wall was a bit too much behind the times for a high technology club like theirs.

They decided to hook a computer to a telephone and allow people with modems and micros, or even ordinary terminals, to dial in and leave their messages on the computer instead.

As modems were even then priced within the reach of the hobbyists in the USA, the idea was very successful.

It was soon taken up by other clubs and also by individuals, with the result that today there are at least 1,000 public and private BBSs operating in North America – and probably considerably more.

Since those early days the software that controls such systems has developed enormously and you can run a BBS on most of the popular micros available in the USA.

British BBS software is still thin on the ground as yet, but some programs are being developed.

Bulletin boards will allow callers to do a wide range of things, but the main emphasis is still on the traditional message and mailbox facilities.

For example, on most BBSs messages can be private or public, general interest or collected into special categories. They will tell you if you have a message waiting when you call, and also let you search for messages on a particular subject.

Other features that you will find on a BBS include information and news files, help for inexperienced users, software to download, games and diversions, commercial sections and even advertising.

The reason I prefer using bulletin boards to Prestel or Micronet, which are the other systems readily available to the home micro user, is that they provide a very interactive type of environment, completely different in character to viewdata systems such as Prestel.

With a BBS you are always able to respond to the information on the system.

If you see something that interests you, you can leave a message about it, either to the originator of the item or to anyone else who calls the system.

In fact exchanging messages is really what BBS are all about.

There will always be a good bit of straightforward information on such systems, but it is usually there in a secondary role. For example there will probably be:

- Information about the system itself and how to use it.
- Information about particular subjects in the special interest sections.
- Files you can download into your own micro.
- Telephone numbers of other systems.

But unless the system has a particular theme of its own, you are unlikely to find much information of general interest on it.

If you are looking for train times, weather reports, financial information, hotel bookings and suchlike the large commercial systems such as Prestel are the place to go.

There is, of course, a certain amount of overlap between Prestel systems and BBS. You will find some news about the micro scene on Micronet and Viewfax 258 on the Prestel system, and also on some

message on a board

BBSs. But on the whole the Prestel systems are very much more one way.

They do have response frames, or places where you can leave messages to the operators of the database concerned, but they don't normally have the public message areas that BBSs have.

The other advantage of BBSs is that they are open to anyone with no subscriptions or membership, and are free of charge (except for the cost of the phone call).

On the other hand ordinary Prestel will cost you £6.50 a quarter (+VAT), and Micro Prestel (which has the software and some other features from the Micronet system on it these days) is a further £10 a quarter.

However most people can get Prestel with a local call, which is something that cannot be said for a BBS. A long distance call can soon chalk up a couple of quid.

If you are choosing a modem my advice would be – if you can possibly afford it – to look for a multi-mode type that will allow you to use both V.21 (300 bit/sec – most BBS) and V.23 (1200/75 bit/sec – Prestel) systems.

The same applies to software. Buy a terminal program that will enable you to use both systems, but remember that to use both you need the right modem AND the right software.

There's no such thing as software that will allow you to use a V.21 system via a V.23 modem, or vice versa.

Happy communicating!

Board	Sysop	Phone no.	Hours
SABBS	Nick Rosser	0698-884804	24 hrs
LBBS	Ray Agostini	0506-38526	24 hrs
BABBS	Mark Templeman	0225-23276 (Ring-back)	21.00-08.00 weekdays 21.00-12.00 weekends
NKABBS	Dave Frost	0795-842324 (Ring-back)	21.30-24.00 daily
Forem '84	Dave Harvey	0903-42013 (Ring-back)	24 hrs
Basildon ITEC	Tony Dwyer	0268-25122	24 hrs

All the above boards operate at 300 baud.

Ring-back procedure

Where a board is listed as "Ring-back", it is important to use the following procedure:

- Dial the number of the board.
- Let the phone ring once and then HANG UP.
- Dial the number again and let it ring until you hear the carrier tone.
- Switch your modem into 'connect' mode and continue with normal procedure.

About 90 per cent of people who ring these boards let the phone ring several times. Then when the sysop answers, assuming it to be a voice call, they hang up. Sysops find this very irritating!

Standard RS 232 setting for use with on line systems:
7 bit word
(excluding parity bit)
Even parity
1 stop bit

Alternative setting that should work with most BBS:
8 bit word
No parity
1 stop bit

I recommend that you use the second setting, as most terminal software just ignores parity anyway, and it will normally work satisfactorily.

It also gives the added possibility of transferring binary data using standard CP/M protocols or XMODEM protocols which give error free file transfer – and which aren't just for CP/M systems.

Trainees call link Basildon

BASILDON ITEC is a training centre in Basildon, Essex set up to offer courses on Information Technology, primarily for the Youth Training Scheme (YTS). The ITEC opened for trainees in February 1984 and has been extremely busy ever since.

Courses in office skills, such as word processing and database management, programming and electronics are available to trainees, using a variety of different computers. Currently we have four computer networks as well as many stand alone devices.

We have been using an Atari computer since the ITEC opened. Initially this was an Atari 800, but it has recently been replaced with an 800 XL, which is used for a variety of tasks, including the trainee and staff payrolls.

The Atari is used as both the manager, Malcolm Bridges and myself have Ataris at home and can transfer data easily from one machine to another.

However the Atari's primary task is communications. It was initially used in this way in the summer of 1984 when we acquired some modems and a simple terminal program. This enabled us to log on to many private and commercial bulletin board systems. This stimulated considerable interest, particularly on my part, and our phone bills jumped through the roof.

Basildon ITEC's bulletin board runs on an Atari 800XL with a 1050 disc drive and an 850 interface to handle the signals to the modem and printer (an Epson MX100).

It uses software from the USA known as Amis. This was sent to us by the Rainbow Computer Company in Orlando, Florida, after we had logged onto their system and had a chat with the systems operator (sysop).

The system operates at 300 baud (300 bits per second) transmit and receive, accepting calls from any computer system operating in Ascii at that rate. However it is rather clever in, that it can recognise Atari computers. This is because Ataris can operate in an enhanced character mode known as AtAscii or Atari Ascii.

When a user logs on it checks for the value transmitted by the Return key. The system will then allow the user to download Atari programs from our database.

Callers can leave messages for each other, and privately for us to read. All incoming calls are logged to the disc and printer and all messages are printed out. Private messages to the sysop, however, are not logged to the disc.

The system is very easy to use and offers help menus for the inexperienced. The information on offer is in the main about Basildon ITEC,

By TONY DWYER

although we do get some interesting messages.

If you would like to call our BB, you will need the following (assuming that you are an Atari user):

- An Atari computer (at least 48k)
- A disc drive (810 or 1050)
- A modem (I recommend WS2000 or Pace Nightingale). Set it at 300 baud. Depending on the modem you choose, you may also need an Atari 850 interface unit.
- Terminal software
- A telephone line
- A printer would be handy

(Readers might like to take advantage of our special communications offer on Page 35.)

Having connected it all together and managed to get the software to run, you are ready to go.

Dial our BB number – it is Basildon 0268 25122. You will hear a ringing tone for a couple of seconds, then you will hear a continuous high pitched tone. This is the carrier tone.

At this point switch on your modem – its carrier detect light should come on. Press the Return key on your Atari a few times. A display will appear asking you to press Return again.

At this point it is testing to see whether it has an Atari on line or some other computer. It will then start transmitting pure text, asking you some polite questions. As soon as you get clean, readable, text, put your phone down.

After you answer it will log your call and let you in to the system. If you call during the day you might like to try the Yell command (menu option Y). It will sound a bell at our end and one of us may break in for a chat via the keyboard. We have made many new friends this way.

Once you get into our system you will find information which we hope you find interesting and useful. One file in which you may be particularly interested is a list of other bulletin boards in the UK (Beware, if you don't transmit text for more than two minutes you will be timed out and disconnected!)

Our system permits the downloading and uploading of programs using Xmodem protocols. Xmodem will ensure that you get a clean download of data.

It does this by sending a block of data and checking a checksum value returned by the receiving computer. If an error is detected it sends the block again. In this way complex programs can be sent. Even machine code is transmitted safely.

Many terminal programs are available for the Atari – commercial ones such as Teletalk and the excellent Home Term. There are also some public domain programs around including Jterm and Amodem.

Our Atari is also used for other tasks. For example, we manufacture a light pen for the Atari computers. Each one is tested on our machine using our own software and sent out with a disc of introductory programs written by myself. The pens are made in our electronics laboratory by our

on Atari to to the world!

YTS trainees.

As our working day is very full I often work at home in the evenings on my own Atari 800. It is used to check out the bulletin board system and for bashing away at ideas for use at work.

One of these is a recently completed program called Joe Bailey. This is an action maze game working in 80 column mode.

The main program consists of a file handler which reads in a file from the disc. In the file is data which the handler uses to identify the next available files (possible choices of nine). The user makes the choice – a one-finger press and the next screen is displayed.

In this way it is possible to have nine different combinations from any of the 64 files available. The idea of the game is to demonstrate how a manager's decision affects the actions of others in a subordinate role. We use it as part of the "Life and social skills" training for our YTS trainees.

In addition to our normal daytime activities our computer club meets on Friday evenings. Most of the members are Atari owners. It is not a formal environment like some clubs, more a social gathering of interested people. We even allow them access to some of our computers.

We have many plans for the future. One involves more Ataris – we have eight 800 XLs on order. These will be used to train primary school children in computer use, making use of the Atari touch tablets and probably Logo.

We plan to involve local schools in this project, intending to give large numbers of young children access to computers under supervised conditions. We also plan to run computer camps during the school summer holidays, again using the Ataris.

Children will be able to spend up to a week, maybe longer, on our premises with guidance on how to use, and possibly program, the computers. We feel that Logo will be very important in this activity. This idea has already been very successful in the USA and we hope to achieve similar results here. I hope to keep you posted in *Atari User* later in the year.



Join the communications revolution

We've found the missing link!

By DEREK MEAKIN
Managing Editor Atari User

MANY months ago we forecast that 1985 would be the Year of Communications. And so it is turning out.

Sales of modems are soaring. More users are joining Prestel in their thousands. Bulletin boards are springing up all over the country.

But until now one thing has been missing.

What has been desperately needed was a national database for microcomputers that would combine a low-cost electronic mail service with a giant bulletin board you could access first time every time, that would allow you to chat freely with other users, that would have no restriction on the length of material you could send or receive – and would also enable you to send telex and telemessages from your own micro.

All this, and much much more, you can do with MicroLink. For this one comprehensive service is the missing link in Britain's communications network.

And the carrier through which all MicroLink's facilities are being offered is the most respected name of all – Telecom Gold.

Until now Telecom Gold has been the preserve of big business – used by the giants of industry, commerce and finance to link their operations in Britain with the rest of the world. And Telecom Gold's charges reflected its elevated status.

That has now changed. Thanks to MicroLink, every Atari user can afford to key into Telecom Gold and make use of its growing range of services. For less than the cost of a first class stamp you can have a message the size of this page delivered to one destination or hundreds . . . all in a fraction of a second. And that's just one example of the time and money you'll be able to save with MicroLink.

All of us at *Atari User* are very excited about the enthusiastic reception the new service has been given by our readers – and about its unlimited potential for future development.

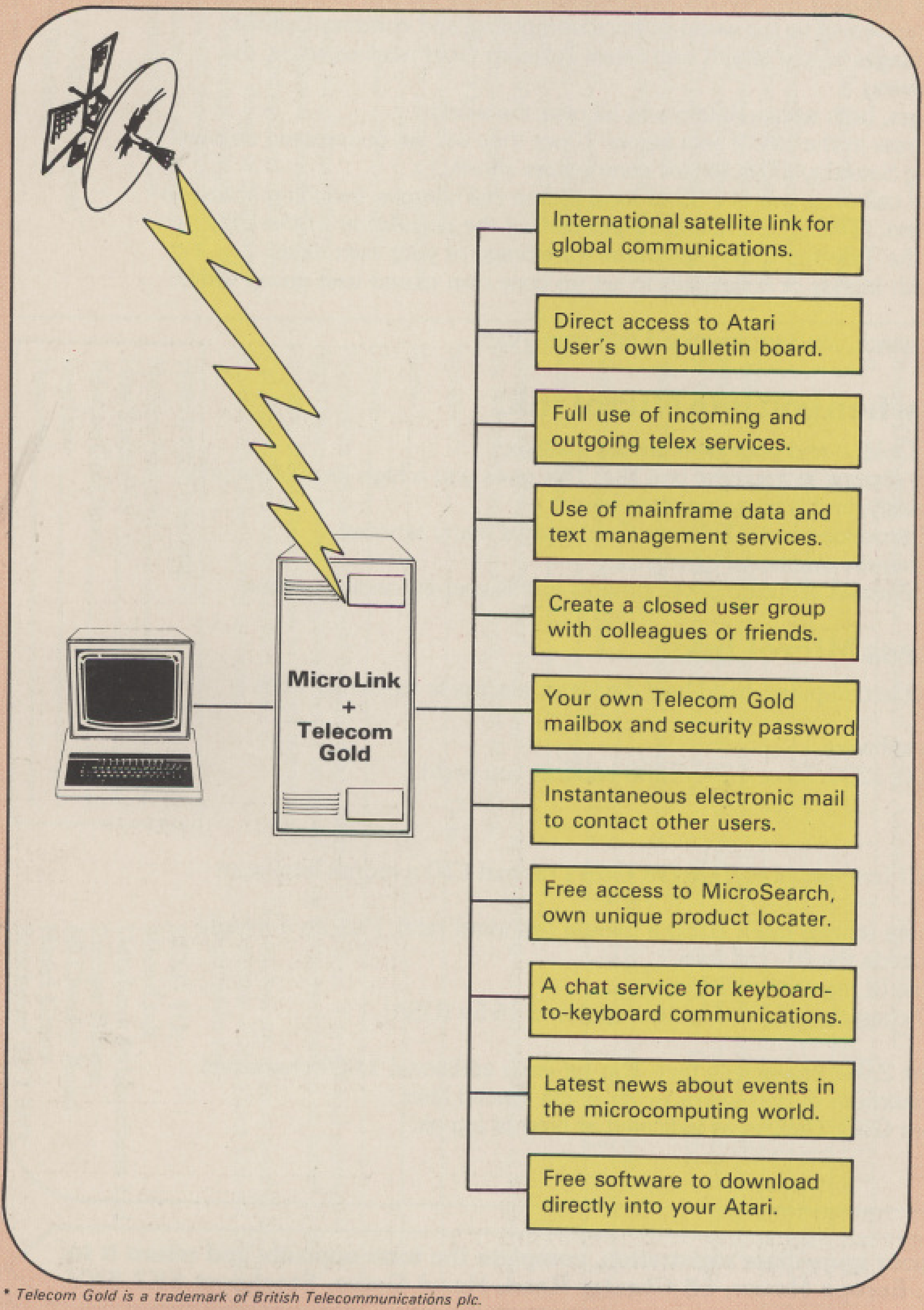
Come and join us – and explore with us the whole new world that is being opened up by MicroLink.

ATARI USER invites you to join . . .

MicroLink

in association with

TELECOM GOLD*



MicroLink is this year's most exciting – as well as most ambitious – development in the rapidly-expanding world of telecomputing.

For the first time, it combines the enthusiasm of many thousands of computer users with the power and versatility of Britain's national database, Telecom Gold.

The result is an international communications link that is your passport to new realms waiting to be explored, new experiences to be shared with kindred spirits who enjoy telecomputing just as much as you do yourself.

Communicating the MicroLink way is ultra-fast – and much cheaper than you might expect. Wherever you live, you get direct access to the Telecom Gold computer at local call rates.

With your own electronic mailbox you can send a message to one destination – or to 500! – for less than you would pay for a first class stamp.

You can send and receive telex messages worldwide, or have a two-way chat with other users in real time.

And the cost of using MicroLink? Just £3 a month. Plus small additional access charges as detailed overleaf.

Join MicroLink now – and let you and your Atari be in the forefront of the new revolution in communications!

** Telecom Gold is a trademark of British Telecommunications plc.*

These are some of the innovative features you'll be able to use when you join . . .

MicroLink

What facilities you can use – directly from your micro:

- Access at any hour of the day or night to Microsearch, our exclusive product locater, which is constantly updated by Britain's major distributors. Powerful, easy-to-use keyword searching means you should find what you want within seconds.
- Direct contact, via electronic mail, with other users throughout the world. And because you're connected via PSS, and not the normal phone links, it's usually much, much cheaper.
- Full use of the closed user group bulletin board – with a special section for Atari users.
- Full service of news about new products and events. All presented in easy-to-read form to keep you right up to date with what is happening in the world of microcomputing and communications.
- Send and receive mailbox messages of any length with other Telecom Gold mailbox users, the number of which is rapidly growing.
- Send and receive telex messages, both within Britain and all over the world.
- Send telemessages to any address in the UK. If sent before 10pm they will get guaranteed delivery the next working day, including Saturday *(This service commences shortly.)*
- If you live outside the 01- local call area, use of PSS at local phone call charges, including access to the international Dialcom system. *(This covers nearly 90 per cent of the population of the UK.)*
- Use, should you require it, of the Telecom Gold mainframe for storage of your own data.
- Encouragement to combine with friends or colleagues to set up your own closed user group within MicroLink.
- Provision of free telesoftware, which you can download into your Atari.

What you will receive when you join MicroLink:

- Free registration on Telecom Gold – and your own private mailbox.
- Free password, which you can change at any time you like. This gives you a high level of security in order to preserve confidentiality, and is known only to you.
- Free instructional manual to introduce you to Telecom Gold and its many services.
- Free Help facility should you require additional assistance.
- Free newsletter to keep you informed of future developments in this ever-expanding service.

What you need to access MicroLink:

- Any personal computer, portable computer, hand-held device or electronic typewriter with communications facilities.
- Appropriate communications software.
- Modem (you can use 300/300, 1200/75 or 1200/1200 baud as you wish).

What will it cost?

- Monthly standing charge of £3 (compared to Telecom Gold's normal £10 a month minimum charge).
- Connect charges: 3.5p a minute (cheap rate); 10.5p a minute (standard rate). Plus 2p a minute PSS charge if calling from outside the 01- call area.
- Once-only telex registration fee (if required): £10.
- Outgoing telex: 5.5p per 100 characters (UK), 11p (Europe) and 16.5p (USA).
- Incoming telex: 50p.
- International mail: 30p for first 2,048 characters, then 15p for each additional 1,024 characters.
- Telemessages: £1.25 for a maximum of 350 words or 35 single spaced lines.
- On-line databases on Telecom Gold: charges as indicated at time of log-on.

To secure your immediate registration, complete the form opposite and return it to: MicroLink, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

MicroLink

in association with

TELECOM GOLD *

Application Form

On receipt of this application form you will be sent

- your personal mailbox number and initial password
- a Quick Guide to Mail manual
- customer HELP LINE telephone number
- the name and mailbox number of your Telecom Gold contact

Please allow 28 days to process your application.

Charges

Initial Registration fee: £5.

Standing charge: £3 per calendar month or part.

Connect: charges for duration of connection for any purpose to the Service. Minimum call charge is 1 minute.

Standard Rate
(0800-1900 M-F excluding public holidays)
10.5p per minute or part.

Cheap Rate
(all other times)
3.5p per minute or part.

Filing: charge for storage of information 20p per unit of 2500 characters per month

(Note: The number of units used is an average calculated by reference to a daily sample. Units will be incurred by the use of telex, short codes and mail filing.)

Information Databases
These vary by database and are charged at the rate shown before you obtain access

MicroLink PSS service
300 baud 2p per minute or part.
1200 baud 2.5p per minute or part.

Telemessages
For each message generated £1.25

** Telecom Gold is a trademark of British Telecommunications plc.*
Telecom Gold Ltd, 60-68 St. Thomas Street, London SE1 3QU.

International Mail
Charges for the transmission of information by the Dialcom service to other Dialcom systems operated outside the UK and the Isle of Man:

	First 2048 chrs. (incl. control information)	*Each additional 1024 characters*
USA, Australia, Canada, Singapore, Hong Kong, Israel	30p	15p
Germany, Denmark	20p	10p

(Note: Multiple copies to addresses on the same system host incur only one transmission of data.)

Billing and Payment

All charges quoted are exclusive of VAT. Currently all bills are rendered monthly and payable on receipt of invoice.

Telex

Telex registration: £10.

Telex outgoing: For the generation of telex by the Dialcom service:

U.K.	5.5p per 100 characters sent
Europe	11p per 100 characters sent
N. America	16.5p per 100 characters sent
Rest of world	£1.15 per 40 characters sent
INMARSAT	£2.75 per 40 characters sent

A 10% discount will apply to telex deferred to overnight transmission using "Night" key word.

Telex incoming: For the delivery of a correctly addressed telex into a mailbox.
Delivering of telex with correct mailbox reference from sender: 50p.
Service charge for obtaining mailbox reference from sender: 50p.

(Note: If a telex is received without a mailbox reference the sender will be advised of non-delivery and requested to provide a mailbox address. It is not possible to deliver a telex without a mailbox reference.)

Contact Telecom Gold for charges relating to other services and additional documentation.

Each User Identifier validated and using the Telex facility will incur a charge of 6 storage units/month. Further storage charges will also be incurred each month depending on the size of the telex queue and use made of the short code and message file facilities.

Radiopager

For the activation of the British Telecom Radiopager by the Dialcom service.
No charge.

Name ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Position ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Company ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Address ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Postcode ☐☐☐☐☐☐☐☐ Telephone ☐☐☐☐☐☐☐☐☐☐

(✓) ☐ I wish to use Telex. I authorise you to charge an additional £10 to my initial bill.
☐ I confirm that I am over 18 years of age.

Signature/s ____________ Date ____________

Whilst Database Publications Limited is the supplier of all the services to you, the commission and billing thereof will be handled by Telecom Gold as agents for Database Publications Ltd.

Payment

Please complete the billing authorisation form below.

Direct Debiting Mandate *(Enter full postal Address of Bank Branch)*

To ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

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I/We authorise you until further notice in writing to charge to my/our account with you on or immediately after 15th day of each month unspecified amounts which may be debited thereto at the instance of British Telecommunications plc – TELECOM GOLD by Direct Debit.

Date of First Payment on or within one month from ☐☐ 19 ☐☐
(enter month of commencement)

Name of Account to be debited ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Account Number ☐☐☐☐☐☐☐☐

Terms and conditions: I/we have read and accepted the terms and conditions as set out on this document and hereby apply to join MicroLink.

Signature/s ____________ Date ____________

Name ____________ Position ____________

Company ____________

Partnership applications should be signed by a partner in the firm: "For self and partners". Applications by limited companies should be signed by an authorised person on behalf of the company. Banks may decline to accept instructions to charge Direct Debits to certain types of account other than current accounts.

☐ I enclose my cheque payable to Database Publications Ltd. for £5 as registration fee.

FOR OFFICE USE ONLY:
Mailbox Assigned ____________
Host System No. ____________
Telecom Gold Agent: ____________
Start Date ____________
Password ____________

SEND TO:
MicroLink
Database Publications Ltd
Europa House
68 Chester Road
Hazel Grove
Stockport SK7 5NY.

AT

This contract is made between Database Publications Ltd. of Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY (DPL) and the subscriber whose name and address appears overleaf.

Whereas DPL has agreed with British Telecommunications plc (BT) through its agent Telecom Gold Limited to sell and distribute the MicroLink Service (the Service) and BT through Telecom Gold Limited has agreed to supply the Service to customers of DPL.

It is agreed as follows:

1. Access
DPL shall issue to the subscriber such user codes (called mailbox numbers) as it thinks fit in order to allow the Subscriber and persons associated with the subscriber, access to use the Service.

2. The Service
The Service shall be BT's Telecom Gold Dialcom Service, and shall comprise such services and facilities as DPL shall in its discretion from time to time consider appropriate, subject to the supply by BT of such services and facilities.

3. Charges
   a) The subscriber shall pay for all charges arising under this contract from his subscription to and/or use of the Service, and/or from the issue to him of any mailbox number issued by DPL to the Subscriber. All charges are payable on demand.
   b) DPL shall give to the Subscriber not less than fourteen days written notice of any alteration in the applicable charges for the Service. The charges applicable at the date of this Subscription are set out overleaf.
   c) Subject to any provision of this contract, liability for charges for service shall commence, unless BT notifies the customer to the contrary, with effect from the first day of the month in which BT first makes service available to the customer.

4. Limitations on use
   a) The Subscriber shall not use, or permit any person to use the Service otherwise than according to instructions given by DPL or BT, existing for the time being and in particular, shall not use the Service for the purpose of sending abusive, offensive, indecent or menacing communications, or for sending communications which cause annoyance, inconvenience, or needless anxiety.
   b) The Subscriber shall not permit any person to use the Service by means of a mailbox number issued by DPL unless the name and relationship of that person to the Subscriber has been disclosed to DPL.

5. Termination
   a) This contract may be terminated by either party giving not less than one month's written notice, such notice to expire on the last day of any calender month.
   b) DPL may terminate this contract forthwith without notice if the Subscriber shall
      i) fail to pay any sum payable under this contract or payable under any other contract with DPL to which the Subscriber is a party.
      ii) be adjudicated bankrupt, enter into liquidation or any arrangement or composition with his creditors, or if a receiver is appointed of any part of the Subscriber's assets and not discharged within seven days, or if any judgment against the Subscriber remains unsatisfied for more than seven days.
      iii) fail to comply with any term of this contract, or any instruction given by DPL or BT under clause 4 of this contract.
   c) DPC may terminate this contract without notice in the event that BT and/or its agent Telecom Gold shall cease to supply the Service.
   d) If the customer fails to comply with any provision of this contract he shall nevertheless continue to be liable for all charges due and to become due for service provided during any period of such failure.

6. Assignment
The subscriber shall not, without the written consent of DPL assign this contract, or any rights or obligations arising under this contract.

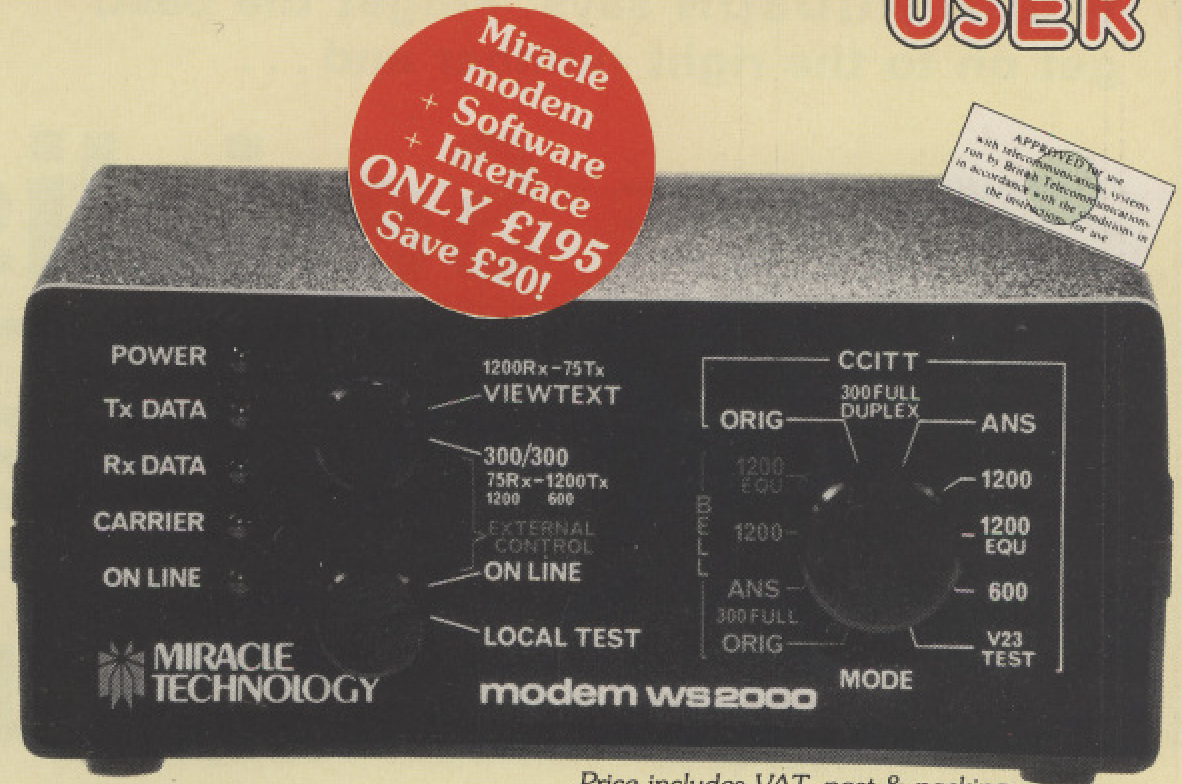
7. Limitation of liability
   a) For the avoidance of doubt neither DPL nor BT has an obligation duty or liability in contract, tort, for breach of statutory duty or otherwise beyond that of a duty to exercise reasonable skill and care.
   b) In any event in no circumstances shall either DPL or BT be liable in contract, tort (including negligence or breach of statutory duty) or otherwise for loss (whether direct or indirect) of profits, business, or anticipated savings or for any indirect consequential loss whatever.
   c) In any event DPL's liability in contract, tort (including negligence or breach of statutory duty) or otherwise arising by reason of or in connection with this contract or howsoever otherwise shall be limited to £500,000 for any one incident or series of incidents and £1m for any series of incidents related or unrelated in any period of 12 months.
   d) DPL does not exclude or restrict its liability for death or personal injury, where such arises as a result of the negligence of DPL or its employees.
   e) The Subscriber shall indemnify DPL against all loss, actions, proceedings, costs, claims and damages arising from
      i) any breach by the Subscriber of his obligations hereunder;
      ii) the use of the Service by third parties by means of any mailbox number issued to the Subscriber.
   f) DPL shall not be liable for any loss or damage occurring through any act or ommission of BT or its agent Telecom Gold Limited, in the supply or failure to supply, the Service to DPL. Notwithstanding anything to the contrary contained hereby, the supply of the Dialcom service shall be upon and subject to the standard terms and conditions of BT from time to time and of which the subscriber shall be deemed to be aware.
   g) Neither party shall be liable for failure to perform its obligations if the failure results from Act of God, Act of Government or other Authority or Statutory undertaking, fire, explosion, accident, power failure, industrial dispute, inability to obtain materials or anything beyond such party's reasonable control.
   h) DPL accept liability hereunder for direct loss caused to the subscriber where such loss arises solely due to acts or omissions of DPL or its employees in the provision of access to the service up to an aggregate maximum of £1,000 or a sum equal to one month's average service charges to the subscriber over the previous 12 months' period, whichever is smaller. Save as otherwise provided herein, DPL shall be under no liability for any loss suffered by the subscriber or by any other person arising from negligence or otherwise.

8. Any notice, consent or other communication required to be given hereunder by either party to the other, shall be made in writing and may be served by first class post to the address of the other as set out herein, and shall be deemed to have been received 48 hours from the time of posting.

9. This agreement constitutes the entire agreement between the Subscriber and DPL in respect of the Service, and no representation, statement, warranty or condition not expressly contained in this agreement or incorporated herein by reference, shall be binding upon DPL as a warranty or otherwise.

10. This agreement shall be governed and construed in accordance with the laws of England, and the English Courts shall have exclusive jurisdiction to determine any disputes arising hereunder.

A money-saving special offer from ATARI USER



Price includes VAT, post & packing

THIS is your passport into the exciting world of telecomputing!

IT'S by far the fastest growing field in micro-computing. All over the world micros are talking to each other over the telephone line. As well as to the ever-increasing number of public and private databases, bulletin boards – and even giant mainframe computers.

We want all *Atari User* readers to share in the new technology that makes all this possible. So we're offering a unique starter pack at an unbeatable price. It gives you everything you need to get in touch with the big wide world outside:

- **Modem**
- **Software**
- **Serial Interface**

The modem is the amazing Miracle Technology WS2000. One of the most powerful on the market, it provides all the facilities you require. Yet it's simplicity itself to use. Just plug it into a standard British Telecom jack and you're away!

The package also features the superb Datari serial interface, which links the modem directly to the Atari's peripheral port without the need for the 850 serial interface.

The best hardware deserves the best software to drive it, and with the specially written Multi-Viewterm program the package is complete. It supports all the standard baud rates – 1200/75, 75/1200, 1200/1200 and 300/300 full duplex.

Your *Atari User* package will allow you to talk directly to other computers, to send your own telex messages, to go tele-shopping – even to download free software programs directly into your Atari.

You will be able to join Micronet/Prestel, which will immediately open up to you a vast menu of 750,000 pages of information – instant world news, sports, holidays, hotels, train and airline timetables, all regularly updated.

And you can become one of a growing number of enthusiasts who are joining MicroLink, the giant database set up in conjunction with Telecom Gold, which is described more fully in this issue.

But first, send for the Miracle package – and enter the fascinating, limitless world of communications!

Use the order form on Page 61

ROBIN HUDSON says: Forget the past, get on to the right number and . . .

Serialise, modulate, communicate!

COMMUNICATIONS is, perhaps, the most interesting area of microcomputing that has yet to be explored by the majority of home computer users.

For many years now the public telephone network has been used to transfer data between computers which are often many hundreds of miles apart.

For companies using computers in this way the advantages are obvious. Large volumes of data, including programs, can be transferred between various establishments very rapidly and without the necessity to physically transport discs, tape or any other storage media.

It is only recently however that the additional equipment – both hardware and software – that was needed to take advantage of the telephone in this way has become sufficiently inexpensive to be used widely in the home.

So let's examine the possibility of using the Atari to communicate via the telephone system.

There are many advantages in doing so.

One major application is the ability to access data which is held on other, often very large, computer systems. The best known example of this is the Telecom Gold service, although many other public database systems exist.

This is an area which is currently arousing great interest, and which will no doubt become one of the more significant aspects of computing in the future.

The transfer of files to other computers, in the same way as is done between mainframe installations, is another area that has great potential in the home.

You've just written a new utility program which you would like a friend, who happens to live at the other end of the country, to test for you.

Instead of sending a fragile disc, which could take days to arrive, you could simply send a copy of the file over the telephone in the space of a phone call.

Another type of system, the "bulletin board" is peculiar to micros. Bulletin boards were first developed in America where micro communications has progressed to a more advanced state than in Europe.

It is simply a micro which accepts telephone calls from other micro users and allows them to access its files, download programs, and, as with electronic mail systems, leave messages for other callers.

It is quite common to find that such systems operate on a worldwide basis with users calling from countries as far apart as Australia, Britain and America.

These are just a few of the possible applications. But what about the equipment required to use the telephone network in this way?

Fortunately the rapid development of large and very large scale integration technology in recent years has made it possible to produce suitable equipment at prices which are no longer prohibitive.

The obvious starting point is some form of interface. In the case of the Atari, until recently this has meant the 850 serial interface module.

The reason for using a serial interface, as opposed to a parallel interface such as that used with Centronics-type printers, is fundamental to the whole area of long distance transmission of data.

Since the telephone network uses only two, three or four wire circuits, data must be transferred in serial form, one bit at a time, in sequence.

However data within a computer is transferred between different components in parallel. This means that in an 8 bit machine such as the Atari, eight individual wires, known collectively as the data bus, are used to move information around a byte at a time. This is termed parallel transfer because eight bits are transferred simultaneously.

We have noted that the primary reason for serialising data for transmission over the telephone network is simply that there are insufficient wires to transmit eight bits at a time. Indeed, it would be

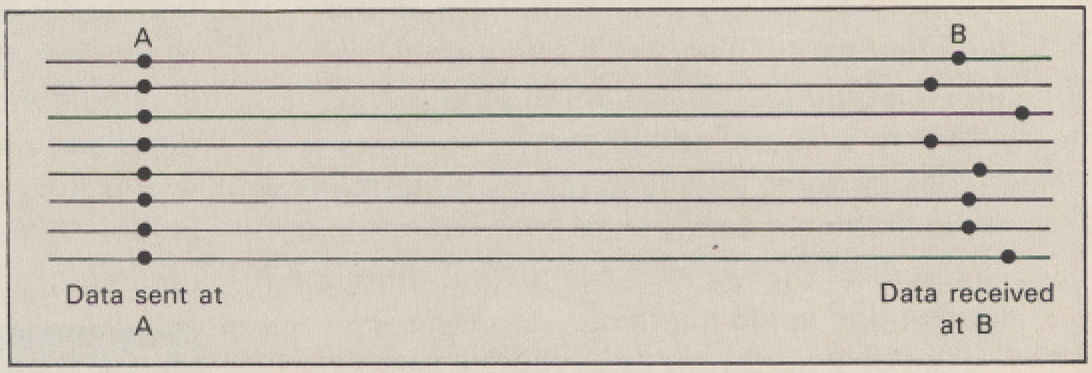


Figure I: Data skew in parallel transfer

extremely expensive to lay eight cables instead of one, and even if this were possible there are further complications with respect to parallel data transfer.

These revolve around the fact that the individual bits of data tend to travel at different speeds within the wires and introduce what is know as data skew. The result is that the data becomes garbled.

This effect, illustrated in Figure I, is more noticeable over greater distances. It is one of the reasons that data cables used with parallel printers are rarely longer than about a metre.

We see then that the function of a serial interface is to convert data from a computer into serial form so that it may be transmitted via a circuit consisting of as little as two wires.

The parallel transfer of n data bits requires n+1 individual wires, n wires for the data and one ground line.

In addition to the obvious economies of using fewer wires, serial data may be transmitted over longer distances than is possible with a parallel interface due to the absence of the skew effect in serial circuits.

What are the other components of a communications system?

Consider the type of signals that a computer generates. These are digital in nature. The Is and Os are represented by two separate and distinct voltage or current levels, generally the former.

The public telephone network however was developed for a different application – the transmission of the human voice which is analogue, as opposed to digital, in nature.

The difference between the two types of signal, analogue and digital, can be seen in Figure II.

The point is that the square waveform produced by digital computers will not pass through the telephone network because of the nature of the network itself and various filters and switching equipment used in telephone exchanges.

To overcome this problem a further piece of equipment is required that will convert digital data into analogue form so that it can then be transmitted via the telephone network. This task, termed modulation, is the function of a modem.

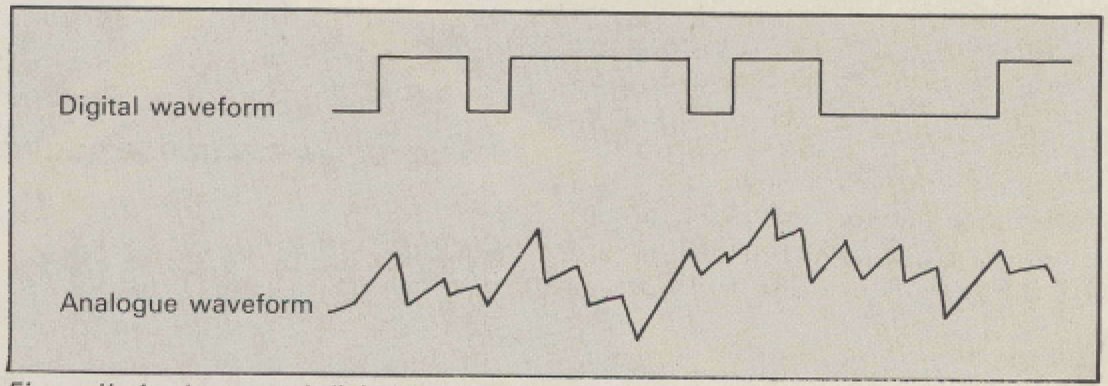


Figure II: Analogue and digital waveforms

In practice a modem carries out two jobs. Digital data for transmission is modulated into analogue form before being passed to the telephone system.

Conversely, received analogue data is demodulated into digital form before being given to the computer.

Hence a modem is used to both *MO*dulate and *DEM*odulate electrical signals.

The final element involved is the software.

The facilities offered by communications software may vary greatly, but essentially it provides the means by which the serial interfaces, and the data passed between them, can be controlled.

Just as a disc filing or disc management system is used to store and retrieve information from disc, communications software may be regarded as the communications management system.

Thus, although the hardware provides the physical means by which data and files can be transferred, some form of protocol is required in order that each computer can understand and use the signals it receives from the other.

These protocols may be regarded as the equivalent of word, sentence and paragraph structure in a spoken language.

In the case of written text, punctuation is used in order to ensure that it makes sense to the reader. Similarly a protocol structure of some form is required to allow two computers to communicate sensibly with each other.

It is the software that provides this structure, along with the facilities for storing and manipulating received data or data to be transmitted.

So we can see that three basic elements, apart from the computer, must be present in a communications system using the telephone network – a serial interface, a modem and the appropriate software.

On a smaller scale, within a particular room for example, it is perfectly possible to link the two computers together without using the telephone system.

In this case a direct wire link between the two serial interfaces is sufficient to allow communication to take place and no modulation is required. Provided that the distance between the computers is not too great there should be no problems.

Using a hard-wired link in this way, however, reveals a further advantage of using the telephone system.

When a hard-wired connection is used only the two computers involved can communicate with each other. The telephone system, however, offers far greater flexibility in that any two computers with access to a phone may be linked.

The 850 module allows a wide variety of modems to be used. Also, modems are now being marketed which don't require an 850 module.

Modems themselves may be obtained with various levels of sophistication, ranging in price from as little as £70 to several hundred pounds.

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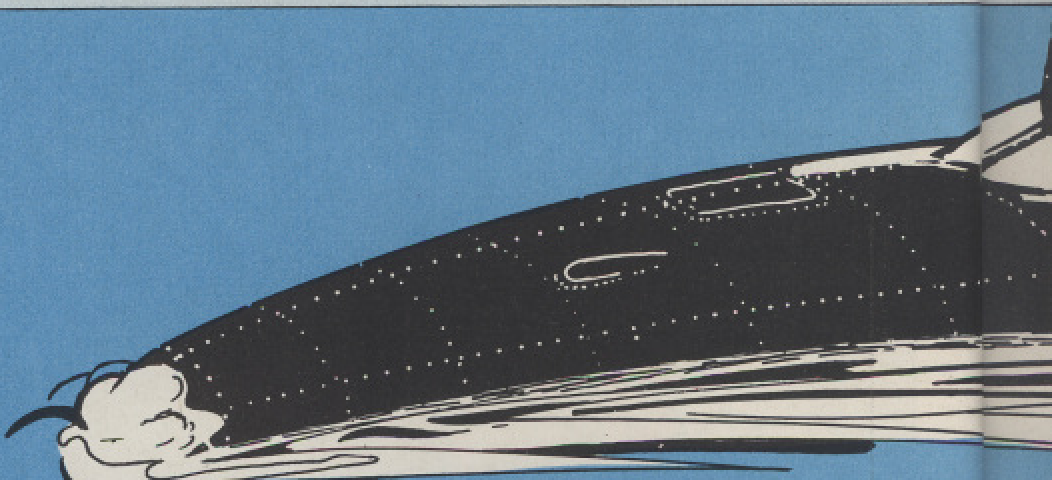
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SUBMARINE



YOU are a destroyer captain alone in a hostile sea surrounded by a pack of submarines which are travelling secretly to a rendezvous. The submarines cannot break radio silence or send for help and must not attack you for fear of giving their position away but you can sink as many of them as you can – with as few depth charges as possible.

On the screen will be shown a board divided into 100 squares. The submarine is hiding in one of those squares. The bottom (horizontal) line is called X and the upright (perpendicular) line is called Y.

Each line of boxes goes from 0 to 9 and you have to give the box numbers to the computer when it asks for your entry. You will be asked to type in a number for the X and Y lines. If you think that the submarine is in a box 8 across and 5 high then return 8 and 5 when the X and Y positions are asked for.

Remember you must press Return after each number.

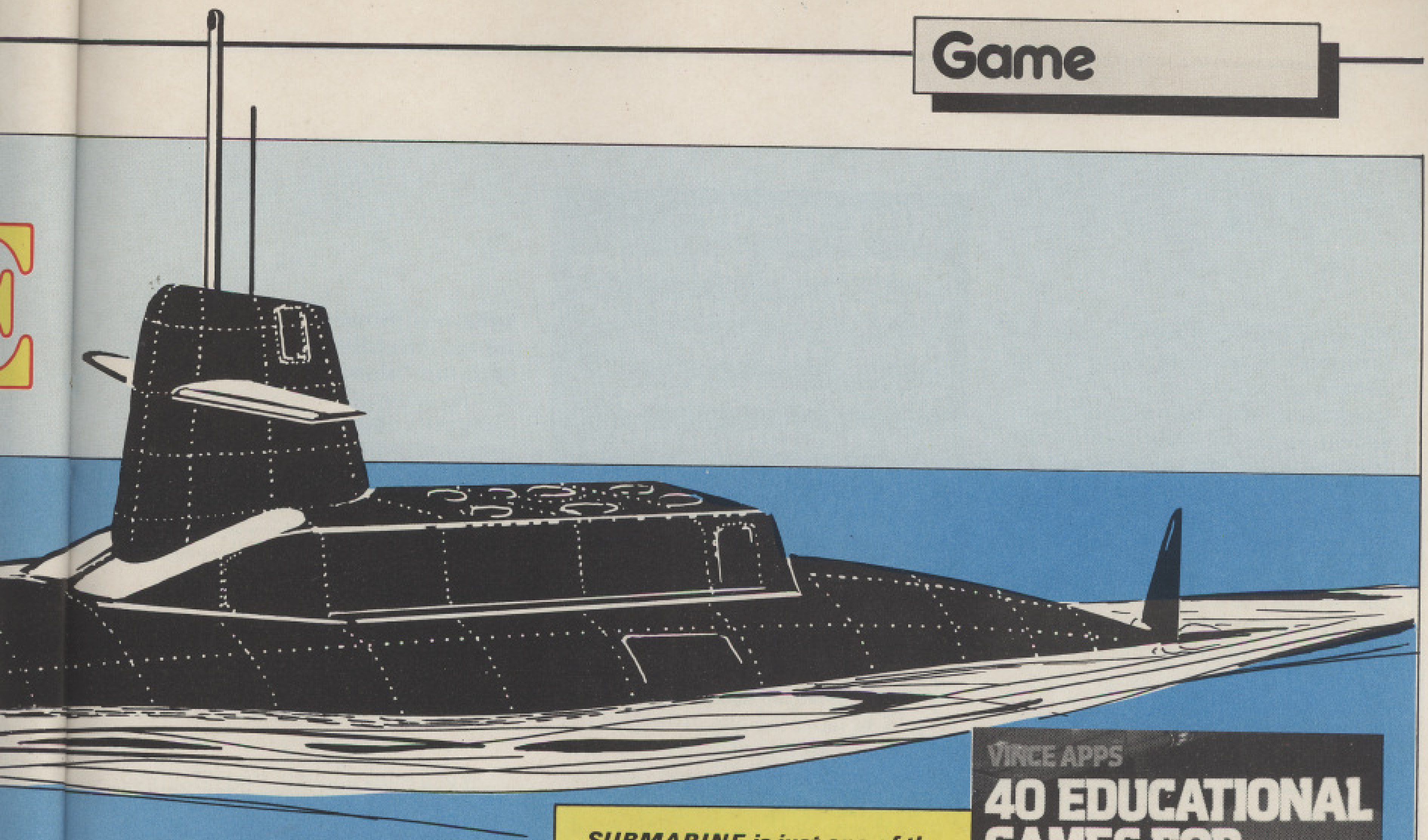
If you make a direct hit you will hear a noise and the screen will show you how many tries you took to sink the submarine.

If you miss, the computer will tell you if your shot was North, South, East or West of the target and you must then plan your next shot. As soon as the submarine is sunk your computer will search

SUBROUTINES

270	Draw grid.
370	Header.
410	Print score.
500	Submarine hit.
610	Submarine missed.

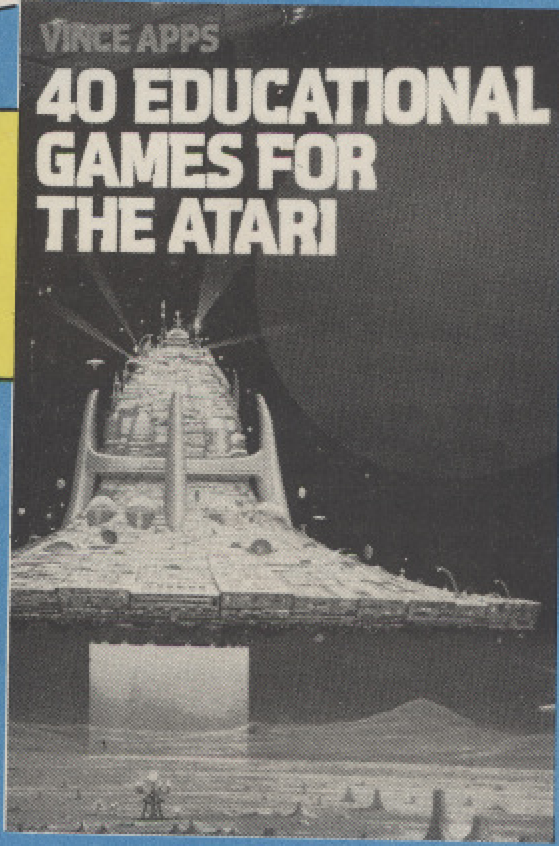
```
10 REM SUBMARINE
20 GRAPHICS 1:POKE 752,1:PRINT
40 SHOTS=0:HITS=0
50 SHOTX=0:SHOTY=0
60 REM LOOP
70 SUBX=INT(RND(1)*10):SUBY=INT(RND(1)
*10)
80 GOSUB 270
90 GOSUB 370
100 GOSUB 410
110 PRINT :PRINT :PRINT :PRINT "YOUR S
HOT"
130 PRINT :PRINT "X ";:INPUT SHOTX
140 IF SHOTX<0 OR SHOTX>9 THEN GOTO 13
0
160 PRINT :PRINT "Y ";:INPUT SHOTY
170 IF SHOTY<0 OR SHOTY>9 THEN GOTO 16
0
180 GOSUB 450
190 IF SHOTX=SUBX AND SHOTY=SUBY THEN
GOSUB 500:GOTO 200
195 GOSUB 610:GOTO 90
200 IF HITS<10 THEN GOTO 60
210 GRAPHICS 0:POKE 752,1:PRINT :GOSUB
 370:GOSUB 410
220 POSITION 0,8:PRINT #6;"WELL DONE !
!!"
230 POSITION 0,10:PRINT #6;"YOU HAVE S
UNK 10 ENEMY SUBMARINES AND"
240 POSITION 0,12:PRINT #6;"HAVE BEEN
PROMOTED TO ADMIRAL"
250 END
270 REM GRID SUB
280 GRAPHICS 1:POKE 752,1:PRINT
290 FOR I=4 TO 15
300 POSITION I,4:PRINT #6;".":POSITION
 I,15:PRINT #6;"."
305 NEXT I
310 FOR I=5 TO 14:POSITION 3,I:PRINT #
6;I-5;".":POSITION 15,I:PRINT #6;"."
315 POSITION I,16:PRINT #6;I-5;:NEXT I
360 RETURN
370 REM HEADER SUB
380 POSITION 0,0:PRINT #6;"SUBMARINE"
390 POSITION 0,1:PRINT #6;"----------"
400 RETURN
410 REM SCORE SUB
420 POSITION 0,18:PRINT #6;"HITS :";HI
TS;" "
430 POSITION 0,19:PRINT #6;"SHOTS:";SH
0
```



and detect another target.

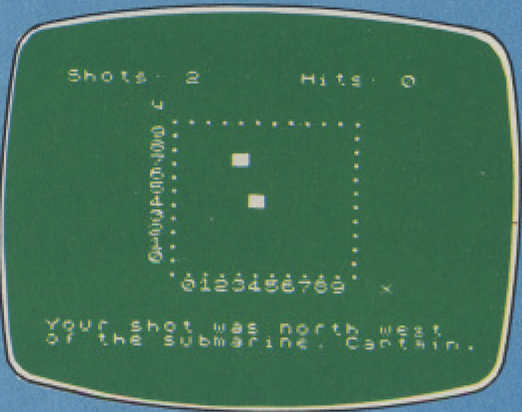
Expert captains should be able to detect and sink the enemy within six moves.

SUBMARINE is just one of the games listed in "40 Educational Games for the Atari" by Vince Apps, price £5.95. We're grateful to Granada-Collins for permission to reprint it here.



VARIABLES

SHOTS	Number of shots.
HITS	Number of hits.
SHOTX	X coordinate of shot.
SHOTY	Y coordinate of shot.
SUBX	X coordinate of sub.
SUBT	Y coordinate of sub.




```
440 RETURN
450 REM SHOT SUB
460 SHOTS=SHOTS+1
470 POSITION 5+SHOTX,5+SHOTY:PRINT #6;
"*"
480 RETURN
500 REM HIT SUB SUB
510 HITS=HITS+1
520 POSITION 0,3:PRINT #6;"direct hit"
540 SOUND 1,160,10,14:FOR Z=1 TO 40:NE
XT Z
550 SOUND 1,200,10,14:FOR Z=1 TO 40:NE
XT Z
560 SOUND 1,170,10,14:FOR Z=1 TO 80:NE
XT Z
570 SOUND 1,0,0,0:FOR I=1 TO 300:NEXT
I
575 POSITION 0,3:PRINT #6;"          "
580 PRINT "ANOTHER SUBMARINE HAS BEEN
DETECTED"
590 FOR I=1 TO 200:NEXT I
600 RETURN
610 REM MISS SUB SUB
620 POSITION 0,3:PRINT #6;"MISSED !"
625 PRINT "YOUR SHOT WAS ";
630 IF SHOTY<SUBY THEN PRINT "NORTH ";
640 IF SHOTY>SUBY THEN PRINT "SOUTH ";
650 IF SHOTX<SUBX THEN PRINT "WEST ";
660 IF SHOTX>SUBX THEN PRINT "EAST "
670 PRINT "OF THE ENEMY SUBMARINE, CAP
TAIN"
680 PRINT "PRESS A KEY"
690 OPEN #1,4,0,"K:"
700 GET #1,A:CLOSE #1
710 POSITION 0,3:PRINT #6;"          "
720 RETURN
```

MIKE BIBBY continues his series of articles aimed at lifting the veil of mystery cloaking the fundamentals of the Atari's workings

There are two schools of thought on subtraction – do you borrow

WE have seen that we can code our numbers in ways other than our usual denary, or decimal, system. We also looked last month at a way of coding known as the binary system, which uses the digits 0 to 1 to represent any number – unlike the denary system which uses the digits 0 to 9.

To distinguish the two systems, we decided to prefix binary numbers with the symbol "%".

The number "one hundred and sixty two" is encoded in each system like this:

In denary,

162 = 100+60+2

In binary,

128 64 32 16 8 4 2 1

% 1 0 1 00010

= 128+32+2

Each column in the binary system, known as a "bit", contains either a one or a zero.

Although the binary representation of a number is rather cumbersome to write, this simple two-state system is easily represented by electrical circuits – which are either ***on*** or ***off.***

We saw that the computer handles bits in groups of eight at a time. Such a group is called a byte. Thus a byte contains eight bits labelled, somewhat perversely, bits 0 to 7. (See Figure I.)

Bit 0, as you can see, is the "1" column. As this is the smallest value bit we say that bit 0 is the least significant bit (LSB). Bit 7, the "128" column, is called the most significant bit (MSB).

The reason for using the numbers 0 to 7 to label the bits instead of the more logical 1 to 8 has to do with powers, a subject you almost certainly covered at school.

*2 to the power 2 is 2*2 = 4*
*2 to the power 3 is 2*2*2 = 8*
*2 to the power 4 is 2*2*2*2 = 16*

and so on. "2 to the power 8" would be eight twos all multiplied together.

Notice that as the powers of two increase – that is, as we multiply more twos together – the answers are doubling, just as our column or bit values do.

Also, 2 to the power of 2 is 4, the value of bit 2, while 2 to the power of 3 is 8, the value of bit 3. It shouldn't come as any surprise to you to find that 2 to the power of 7 is 128, the value of bit 7.

You can verify this on the Atari by using the symbol "^" which stands for "to the power of". It shares a key with the * sign.

Try:

```
PRINT 2^4
PRINT 2^7
```

Be sure to try 2^1, which will show you why bit 1 has the value 2. Also try 2^0. The answer may surprise you. The fact is that any number to the power 0 is 1!

Hence bit zero has the column value of one. Figure II illustrates this.

Look at this sum:

```
  % 1
+ % 1
  %10
```

If you think about it, that is correct, since the sum adds one and one, and the answer %10 is binary for two.

One way of relating this to our usual way of doing sums is to say that we carry when we get to two, instead of ten as we do in our normal, denary, sums.

Another way to look at it is that we have to carry when we get to two because we aren't allowed to use the digit '2'.

If you remember, last month we had a rule forbiding two "coins" of the same value.

Try this sum:

```
       4 2 1
  %      1 1  in        3
+ %      1 0  denary  + 2
  %1     0 1            5
```

Here we carry from the second column to the third.

Addition is not very hard at all – just make sure that you always "put 0 down and carry 1" when you get a two.

If you get a three then "carry one for two and put one down".

For example:

```
      8 4 2 1
  %     1 1 1  in        7
+ %       1 1  decimal  +3
  %   1 0 1 0           10
```

Subtraction is a little more complicated, and depends on whether

you borrow or decompose! The latter phrase doesn't describe the current economic climate. It's just that there are two schools of thought on the way subtraction should be taught – the borrowers and the decomposers.

Fortunately, we can ignore binary subtraction since we can manage without it – as does the microprocessor inside your machine.

If you want to do some binary subtraction it is straightforward enough provided that you remember that it is two you're borrowing or taking, not ten. Figure III illustrates the process – without any attempt to explain it.

Before we leave the realm of simple sums, look what happens if we shift everything in a binary number over to the left, putting a zero into bit 0, which would be left vacant otherwise.

For example:

```
      8 4 2 1
  %     1 0 1    which is 5
becomes
      8 4 2 1
  %   1 0 1 0    which is 10
```

This shifting to the left doubles the number automatically. This isn't too hard to visualise, because the value of each bit is transferred to the next higher bit, which is of course double in value – so the end result is that the whole number is doubled in value.

Similarly, we can do the binary equivalent of 12 divided by 2 by shifting to the right.

For example:

```
      8 4 2 1
  %   1 1 0 0    which is 12
becomes
      8 4 2 1
  %     1 1 0    which is 6
```

and, of course, 12 divided by 2 gives you 6.

As each bit is moved to the right, it occupies a column exactly one half lower in value, thus the sum total of all the bits is one half lower. Note the original bit 0 has disappeared altogether. The loss of this bit can cause some inaccuracies. After all, if it were 1, when it's halved it should contribute 0.5 to the answer. As it is, it's ignored.

For example, if we try to do 13 divided by 2 in binary by shifting each bit right, the equivalent of 13,

```
      8 4 2 1
  %   1 1 0 1
```

becomes

```
      8 4 2 1
  %     1 1 0
```

which is 6 in decimal. Now 13 divided by 2 gives 6.5, not 6, so what happened to the 0.5?

Well, when we shifted over the original bit 0 (which had the value 1), we shifted it "out of the byte". If you like, it dropped off the end, and doesn't appear in the answer.

Of course, it's this disappearing 1 that should give us the missing 0.5 when it's halved.

This sort of division, where you're only concerned with the wholes in the answer, and ignore any remainders, or decimal parts, is called integer division.

● *Well, that's enough binary for one month. Next month it's hexadecimal*

Bit number	7	6	5	4	3	2	1	0
	1	0	0	0	1	1	0	1
Bit value	128	64	32	16	8	4	2	1

Figure I: The bit pattern for 141

Bit number	7	6	5	4	3	2	1	0
Bit value	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
	128	64	32	16	8	4	2	1
	1	1	0	0	1	1	0	0

Figure II: The bit pattern for 204

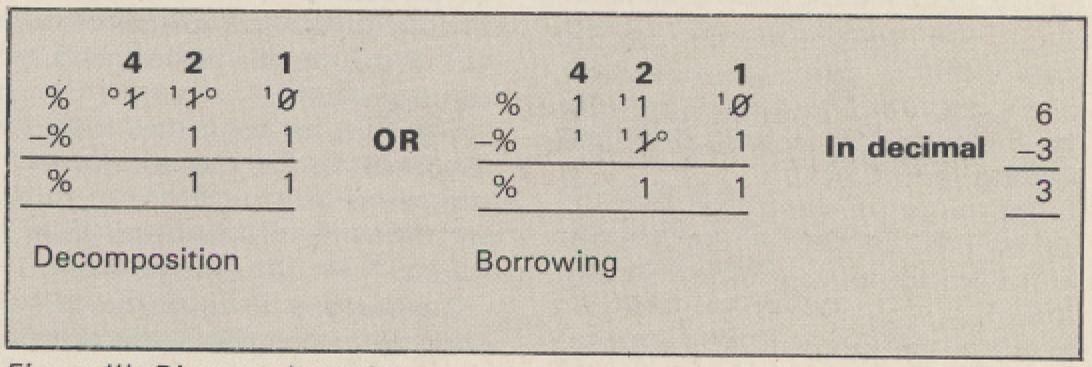


Figure III: Binary subtraction

...ow or just decompose?

PETE BIBBY strikes a chord with his Atari

Have fun with these musical experiments ...

LET's start off this month with four notes played at once by entering:

```
SOUND 0,121,10,8 :SOUND 1,96,10,8:
SOUND 2,81,10,8:SOUND 3,68,10,8
```

While not likely to make Beethoven roll, the above should refresh your memories of the structure of the SOUND command. As you'll remember, it takes the form:

```
SOUND channel,pitch,distortion,
volume
```

Hence the SOUNDs we've just entered in command mode produced a note on each channel with loudness 8, and distortion 10. Each note had a different pitch parameter. The result was the chord you heard and are still hearing if you haven't done anything about it.

If you're still plagued by the chord you can bring things to an end with:

```
END
```

or, more elegantly, with:

```
FOR CHANNEL=0 TO 3:
SOUND CHANNEL,0,0,0:
NEXT CHANNEL
```

which switches off each channel in turn. Table I summarises the SOUND parameters.

Program I produces the same chord, but this time the length of time it plays for is limited.

As you can see and hear, lines 20 to 50 produce the familiar sounds. Line 60 does nothing, it's just a delay loop.

While the program is still going, working its way round the loop, the

```
10 REM PROGRAM I
20 SOUND 0,121,10,8
30 SOUND 1,96,10,8
40 SOUND 2,81,10,8
50 SOUND 3,68,10,8
60 FOR DELAY=1 TO 500:NEXT DELAY
```

Program I

notes still sound. When the loop finishes, the program comes to an end and so do the notes.

Try changing the values of the loop variables in line 60 or even leaving it out altogether and see what happens.

And, while you're feeling experimental, try altering the volume parameters. So far, I've had the total volume parameter of each note adding up to 32 (8+8+8+8).

If you start playing notes with volume parameters that total over 32, strange things can happen. You have been warned.

Program II has us entering the world of music by playing the scale of C. If you don't understand what a scale is, don't worry too much. Just listen to the notes played and I think you'll agree that the sequence has a "complete" feeling to it.

This is because the series of notes follows a common pattern, the pitch rising by a standard unit known as a tone, then by another tone, then a half tone and so on.

Don't be too concerned with the musical terms, just compare the pitch parameters of the notes in Program II with the names of the notes in Table II and you'll see the pattern.

Because the first note played is C (pitch parameter 121), the scale is known as the scale of C (or, more properly, C major). The pitch range it covers (from 121 to 60) is called an octave.

We could start the scale on D or F and, provided we follow the same

channel	pitch	distortion	volume
0 to 3	0 to 255	0 to 14 (in 2's)	0 to 15

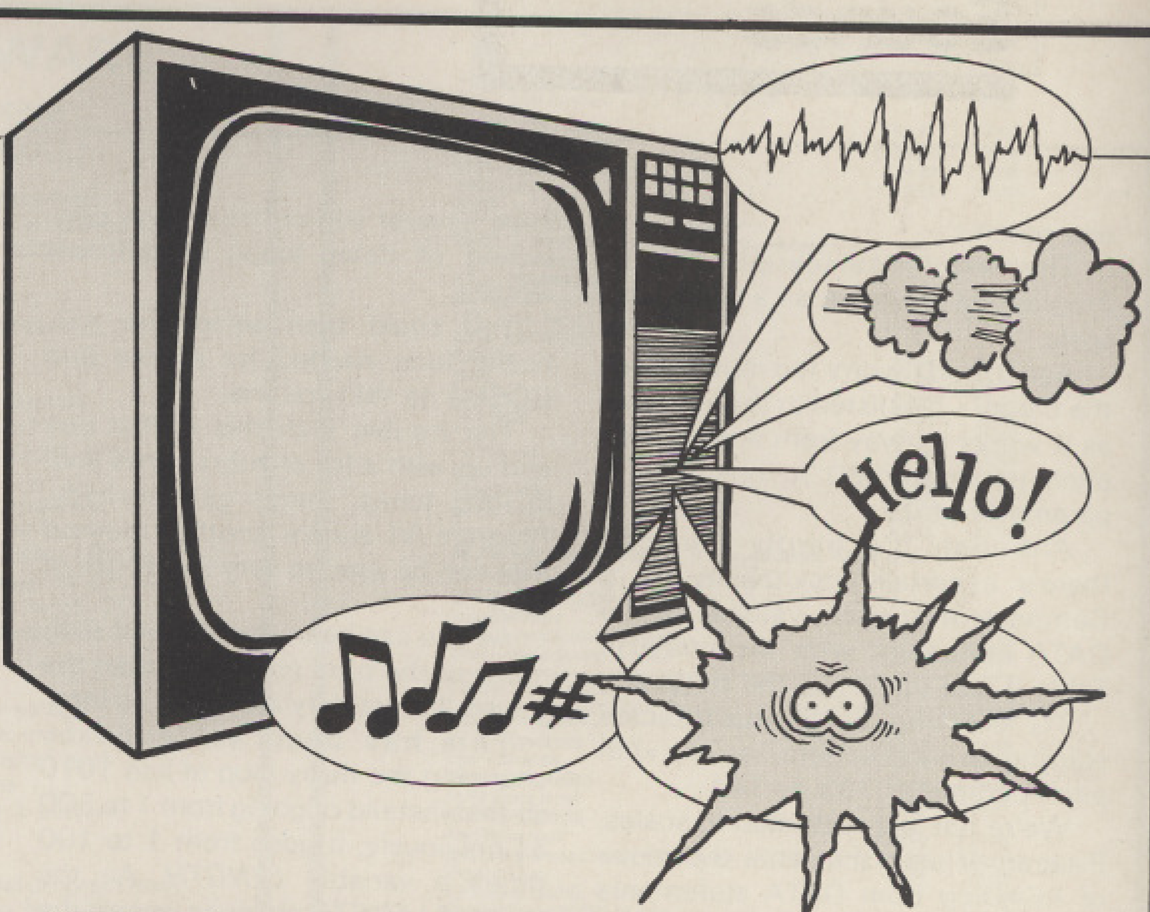
Table I

NOTE	PITCH PARAMETER	
C	29	OCTAVE 1
B	31	
A#	33	
A	35	
G#	37	
G	40	
F#	42	
F	45	
E	47	
D#	50	
D	53	
C#	57	
C	60	OCTAVE 2
B	64	
A#	68	
A	72	
G#	76	
G	81	
F#	85	
F	91	
E	96	
D#	102	
D	108	
C#	114	
C	121	OCTAVE 3
B	128	
A#	136	
A	144	
G#	153	
G	162	
F#	173	
F	182	
E	193	
D#	204	
D	217	
C#	230	
C	243	

Table II

```
10 REM PROGRAM II
20 SOUND 0,121,10,8
25 FOR DELAY=1 TO 500:NEXT DELAY
30 SOUND 0,108,10,8
35 FOR DELAY=1 TO 500:NEXT DELAY
40 SOUND 0,96,10,8
45 FOR DELAY=1 TO 500:NEXT DELAY
50 SOUND 0,91,10,8
55 FOR DELAY=1 TO 500:NEXT DELAY
60 SOUND 0,81,10,8
65 FOR DELAY=1 TO 500:NEXT DELAY
70 SOUND 0,72,10,8
75 FOR DELAY=1 TO 500:NEXT DELAY
80 SOUND 0,64,10,8
85 FOR DELAY=1 TO 500:NEXT DELAY
90 SOUND 0,60,10,8
95 FOR DELAY=1 TO 1000:NEXT
DELAY
```

Program II



If you start playing notes with volume parameters that total over 32 . . . strange things can happen

pattern of increases in pitch, we'd end up with the scale of D or F. I leave that to you as an academic exercise.

One thing you'll notice about Program II is the inordinate number of delay loops. There's one after every SOUND command, each one determining how long the note is going to last.

The note plays until the following loop is finished, then the program goes on to the next SOUND and its delay loop and so on.

Apart from the final delay loop, they're all the same.

The situation begs for a subroutine to do the work of all these loops. Program III delivers the goods.

```
10 REM PROGRAM III
20 SOUND 0,121,10,8
25 GOSUB 1000
30 SOUND 0,108,10,8
35 GOSUB 1000
40 SOUND 0,96,10,8
45 GOSUB 1000
50 SOUND 0,91,10,8
55 GOSUB 1000
60 SOUND 0,81,10,8
65 GOSUB 1000
70 SOUND 0,72,10,8
75 GOSUB 1000
80 SOUND 0,64,10,8
85 GOSUB 1000
90 SOUND 0,60,10,8
95 FOR DELAY=1 TO 1000:NEXT
DELAY
100 END
1000 FOR DELAY=1 TO 500:NEXT
DELAY
1010 RETURN
```

Program III

Here each delay loop, apart from the last, has been replaced by one single loop. This is coded in a subroutine at line 1000.

Now, when the SOUND commands produce a note, the program GOSUBs 1000 to produce the delay that will allow us to hear it.

It's not great programming, but it's a lot neater than Program II.

Incidentally, the END of line 100 isn't there to stop the notes. These will end after the final delay loop finishes.

The purpose of the END is to prevent the program crashing into the lines defining the subroutine and so causing problems. Try leaving it out and you'll see what I mean.

Despite the use of GOSUBs for the delay loops, Program III still leaves a lot to be desired.

Do we really need all those SOUND statements, one after another? After all, apart from the pitch parameter changing, they are all the same.

Wouldn"t it be better to use just one in a FOR . . . NEXT loop, reading the various pitch parameters from a DATA statement? Program IV supplies the answers.

Here the FOR . . . NEXT loop formed in lines 30 to 60 cycles 13 times. Each time round, the READ of line 40 takes a value from the DATA statement of line 2010 and stores it in the variable *PITCH*.

Line 50 produces a note using *PITCH* while the GOSUB of line 60 brings the delay loop into play.

Looked at musically, the program plays a series of 13 notes, forming an octave.

The gap between the pitch of each note is called a semitone.

The semitone is the standard unit of Western music, two semitones joining together to form a pitch gap of

→

```
10 REM PROGRAM IV
20 DELAY=1000
30 FOR SEMITONE=1 TO 13
40 READ PITCH
50 SOUND 3,PITCH,10,8
60 GOSUB DELAY
70 NEXT SEMITONE
80 END
1000 REM DELAY LOOP
1010 FOR SLOW=1 TO 500:NEXT SLOW
1020 RETURN
2000 REM PITCH DATA
2010 DATA 60,57,53,50,47,45,42,
40,37,35,33,31,29
```

Program IV

one tone.

The whole series played by Program IV is known as a chromatic scale.

Again, don't worry too much about the theory – just listen to the program as it works its way from a note with pitch parameter 60 to one with a parameter of 29.

Although it's hardly musical, there's a certain inevitability to it. Compare the pitch values in the DATA statement with the notes in Table II and you'll see the pattern.

Try creating a chromatic scale starting on another note, say one with pitch parameter 193 or 144.

We're not just restricted to scales. Program V uses the same technique of READing from DATA statements to produce an eight-note tune.

You'll see that the structure of the program is more or less the same as Program IV.

What's different is the DATA statement, which now holds the pitch parameters of the tune. As before, these are read one by one and used to produce the notes.

Using this method, it's easy to write tunes, placing your own values

```
10 REM PROGRAM V
20 DELAY=1000
30 FOR TUNE=1 TO 8
40 READ PITCH
50 SOUND 3,PITCH,10,8
60 GOSUB DELAY
70 NEXT TUNE
80 END
1000 REM DELAY LOOP
1010 FOR SLOW=1 TO 500:NEXT SLOW
1020 RETURN
2000 REM PITCH DATA
2010 DATA 121,108,121,108,72,91,
81,121
```

Program V

in the DATA line.

Table II, trial and error, exasperation and inspiration in equal parts should go a long way to making you an Atari maestro. However, one thing that you'll notice before long is that no matter how nice your tune is, it's boring.

The reason is that the notes in it are all the same length. There's no variety. This is because we've been using the same subroutine to produce the delay that allows the notes to be heard.

One way round this would be to have several subroutines, each consisting of delay loops of different lengths.

You could then select the particular loop needed for a note and GOSUB to that routine.

The trouble with this is that you end up with a lot of subroutines and, in long tunes, things get unwieldy. Program VI shows another method that can be used to vary the length of note.

As you can hear, the fifth and sixth notes of the tune are longer than the others. In fact they are twice as long.

This has been achieved by changing the delay loop of line 1010 so that instead of going from 1 to 500 as previously, it goes from 1 to 100 times a variable *LENGTH*. As the value of *LENGTH* changes, so will the number of times the loop cycles.

If *LENGTH* is 2 then the loop will cycle from 1 to 200. If it is 10, then it will go from 1 to 1000.

Obviously as *LENGTH* varies, so the loop cycles for a longer period. And as the period of the loop changes, so does the length of the note.

Line 40 has been changed so that it reads in both the *PITCH* and *LENGTH* of each note. Similarly the data in line 2010 has been altered to supply both the pitch and length of each note.

In this case the fifth and sixth notes have a *LENGTH* of 10 while the rest have a *LENGTH* of 5. Hence these notes last twice as long as the others.

This technique of using a variable in the delay loop is extremely flexible.

In the above example I've used *LENGTH* values of 5 and 10. The more-musical may prefer to use

```
10 REM PROGRAM VI
20 DELAY=1000
30 FOR TUNE=1 TO 8
40 READ PITCH,LENGTH
50 SOUND 3,PITCH,10,8
60 GOSUB DELAY
70 NEXT TUNE
80 END
1000 REM DELAY LOOP
1010 FOR SLOW=1 TO 100*LENGTH:
NEXT SLOW
1020 RETURN
2000 REM PITCH/LENGTH DATA
2010 DATA 121,5,108,5,121,5,108,
5,72,10,91,10,81,5,121,5
```

Program VI

values of 2, 4, 8, 16, to mimic Western note structure. It's up to you.

One thing about Program VI is that it's slow. Program VII shows how to speed things up, using another variable *TEMPO*.

Again, we've tampered with the delay loop in line 1010. Now it cycles from 1 to *TEMPO*LENGTH*.

Before we always had a value of 100. Now this has been replaced with *TEMPO* which was given the value 50 in line 20. As a result, the delay loop is shorter and the tune is played more quickly.

Notice that the effect of altering *TEMPO* is the same on every note of the tune. Each one plays for exactly

```
10 REM PROGRAM VII
20 DELAY=1000:TEMPO=50
30 FOR TUNE=1 TO 8
40 READ PITCH,LENGTH
50 SOUND 3,PITCH,10,8
60 GOSUB DELAY
70 NEXT TUNE
80 END
1000 REM DELAY LOOP
1010 FOR SLOW=1 TO TEMPO*LENGTH:
NEXT SLOW
1020 RETURN
2000 REM PITCH/LENGTH DATA
2010 DATA 121,5,108,5,121,5,108,
5,72,10,91,10,81,5,121,5
```

Program VII

half as long as it did before.

However, relative to each other, the lengths are still in the same proportion. The fifth and sixth notes are still twice as long as the others.

And that's where we'll leave the SOUND command. As I think you'll agree. it's not all that difficult to use if you take it step-by-step.

Now it's up to you. Program VII contains the basis of any tune you may wish to play. All you have to do is discover the notes that make up the tune and how long they last.

It sounds like fun.

I WOULD like to correct the impression given by the title of last month's article that I thought Basic sound on the Atari was difficult. In fact, the whole point was that it's not all that hard – certainly easier than it looks at first sight.

My apologies to all Atari sound freaks who felt I'd done the micro an injustice. – **PB**

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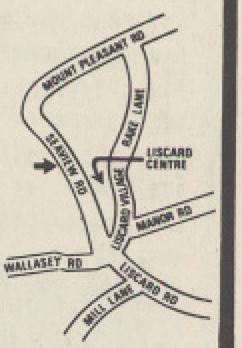
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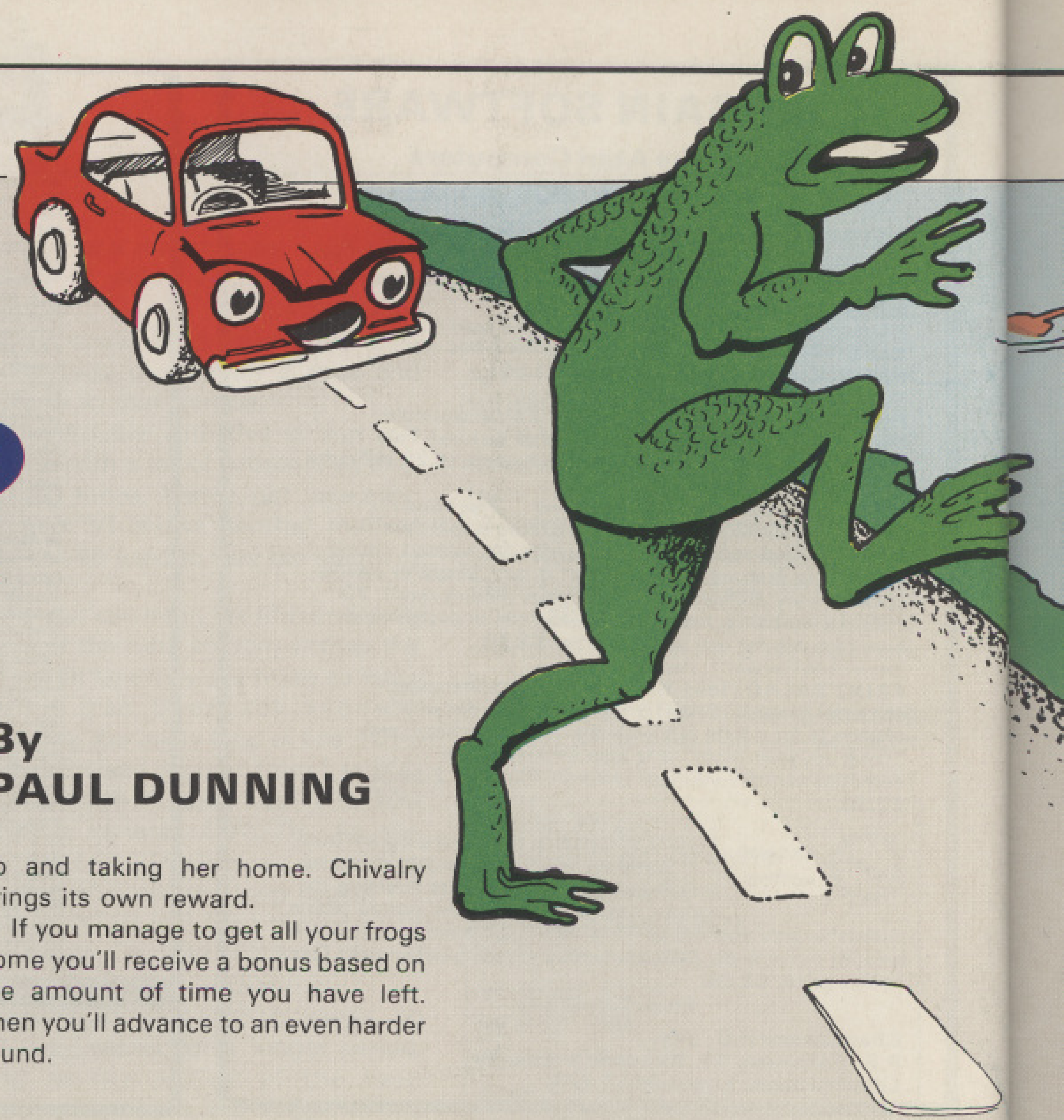
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FROG JUMP



IN Frog Jump you use the joystick to control a frog which is trying to get home. The object of the game is to get five frogs safely home, past the road and river.

You must dodge the cars on the road and jump on to passing boats on the river, but do *not* jump on the yellow boats.

Sometimes you may see your girlfriend on one of the boats. You can get 200 bonus points by picking her up and taking her home. Chivalry brings its own reward.

If you manage to get all your frogs home you'll receive a bonus based on the amount of time you have left. Then you'll advance to an even harder round.

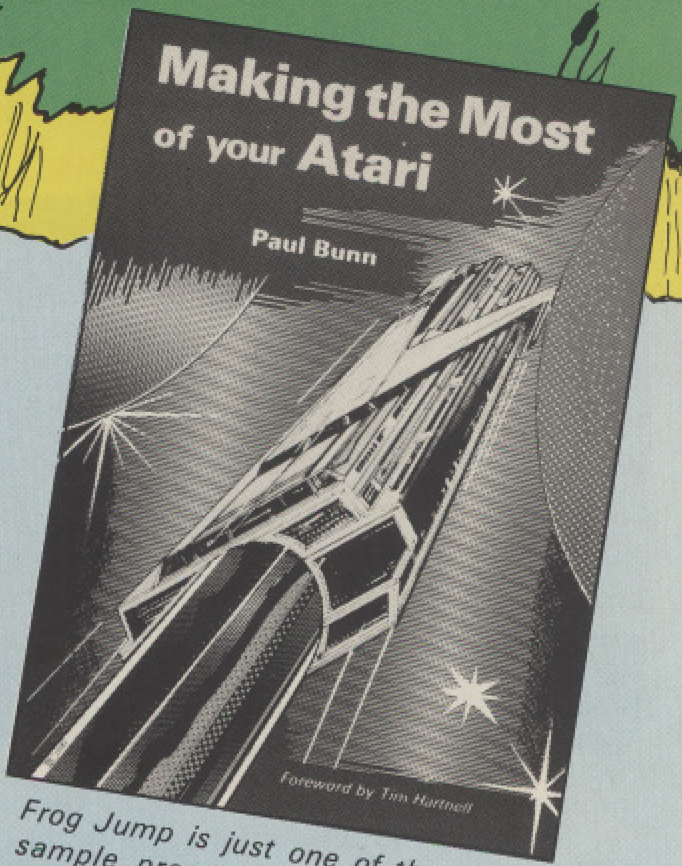
By PAUL DUNNING


```
10 REM ************************
20 REM *      FROG JUMP       *
30 REM *      _________       *
40 REM *   BY PAUL DUNNING    *
50 REM ************************
60 DIM P$(20),L1$(22),L2$(20),C1$(20),
C2$(20),T1$(20),T2$(20),X$(20),Y$(20),
F$(4):RAM=(PEEK(106)-16)*256
70 GRAPHICS 17
80 IF PEEK(RAM+9)=0 THEN GOSUB 1140
90 GRAPHICS 17:SETCOLOR 0,2,3:SETCOLOR
 1,12,5:SETCOLOR 2,13,8:SETCOLOR 3,2,6
:SETCOLOR 4,8,1
100 X3=19:E=1:T1=50:J=1:M=3:X=10:Y=19:
C=7:POKE 756,RAM/256:RESTORE 150
110 P$(1)=CHR$(132):P$(20)=CHR$(132):P
$(2)=P$:F$(1)=CHR$(167):F$(4)=CHR$(167
):F$(2)=F$
120 L1$=" !!!!!      !!!!!    "
130 L2$="  !!  !!  !!  !!  !!"
140 FOR Q=1 TO 20:READ V:C1$(Q,Q)=CHR$
(V):NEXT Q
150 DATA 32,163,163,32,32,163,163,32,3
2,163,163,32,32,163,163,32,32,163,163,
32
160 C2$="  #   #   #   #   # "
170 FOR Q=1 TO 20:READ V:T1$(Q,Q)=CHR$
(V):NEXT Q
180 DATA 32,166,166,166,32,32,32,134,1
34,134,32,32,32,134,134,134,32,32,32,3
2
190 FOR Q=1 TO 20:READ V:T2$(Q,Q)=CHR$
(V):NEXT Q
200 DATA 32,32,32,32,134,134,134,32,32
,32,166,166,166,32,32,32,134,134,134,3
2
210 POSITION 0,10:? #6;P$
220 POSITION 0,20:? #6;P$
230 POSITION 0,0
240 FOR Q=1 TO 40:READ V:? #6;CHR$(V);
:NEXT Q
250 DATA 132,132,32,132,132,32,132,132
,32,132,132,32,132,132,32,132,132,32,1
32,132
260 DATA 133,133,32,133,133,32,133,133
,32,133,133,32,133,133,32,133,133,32,1
33,133
270 COLOR C:PLOT X,Y
280 POSITION 0,6:? #6;L1$:GOSUB 690:PO
SITION 0,8:? #6;T1$:GOSUB 690:POSITION
 0,4:? #6;T2$:POSITION 0,2:? #6;L2$
290 GOSUB 690:POSITION 0,12:? #6;C1$:G
OSUB 690:POSITION 0,15:? #6;C2$:GOSUB
690:POSITION 0,18:? #6;C1$:GOSUB 690
300 COLOR OC:PLOT X,Y
310 LOCATE X,Y,CR
320 IF CR<>32 AND CR>10 AND Y>10 THEN
GOSUB 850
330 COLOR C:PLOT X,Y
340 X$=L2$(1,19):Y$=L2$(20,20):Y$(LEN(
Y$)+1)=X$:L2$=Y$
350 X$=L1$(1,19):Y$=L1$(20,20):Y$(LEN(
Y$)+1)=X$:L1$=Y$
360 X$=C1$(1,19):Y$=C1$(20,20):Y$(LEN(
Y$)+1)=X$:C1$=Y$
370 T1$=T1$(2,20):T1$(20,20)=T1$(1,1)
380 T2$=T2$(2,20):T2$(20,20)=T2$(1,1)
390 C2$=C2$(2,20):C2$(20,20)=C2$(1,1)
400 S=STICK(0):COLOR 2
410 POSITION 5,23:? #6;"score-";SC
420 POSITION 5,22:? #6;"time -";T;" "
430 POSITION 0,23:? #6;F$(1,M);" "
440 T1=T1-0.05:T=INT(T1)
450 IF S=7 THEN COLOR OC:PLOT X,Y:X=X+
1:LOCATE X,Y,OC:C=8:GOSUB 820
460 IF S=11 THEN COLOR OC:PLOT X,Y:X=X
-1:LOCATE X,Y,OC:C=9:GOSUB 820
470 IF S=14 THEN COLOR OC:PLOT X,Y:Y=Y
-J:LOCATE X,Y,OC:C=7:GOSUB 820
480 IF S=13 THEN COLOR OC:PLOT X,Y:Y=Y
+J:LOCATE X,Y,OC:C=10:GOSUB 820
490 IF OC<>32 AND OC>10 AND Y>10 THEN
GOSUB 850
500 IF OC=32 AND Y<10 AND Y>0 THEN GOS
UB 850
510 IF Y<11 THEN J=2
520 IF Y>10 THEN J=1
530 IF OC=134 THEN X=X-1
540 IF OC=7 THEN GOSUB 1320
550 IF OC=33 THEN X=X+1
560 IF OC=166 THEN X=X-1:TT=TT+1:IF TT
=5 THEN TT=0:X=X+1:GOSUB 850
570 IF Y=0 AND OC=32 THEN GOSUB 730:GO
TO 610
580 IF Y=0 THEN GOSUB 850
590 IF X>19 THEN X=X-1:GOSUB 850
600 IF X<0 THEN X=X+1:GOSUB 850
610 COLOR C:PLOT X,Y
620 IF RND(1)>0.95 AND HF=0 THEN HH=0
630 IF H=0 AND HH=0 THEN GOSUB 1330:IF
 H=0 THEN 670
640 IF HH=1 THEN 670
650 X3=X3-1:IF X3<2 THEN H=0:HF=1:HH=1
660 COLOR 7:PLOT X3,8
670 REM
680 GOTO 270
690 LOCATE X,Y,AC:IF AC<7 OR AC>10 THE
N OC=AC
```



SUBROUTINES

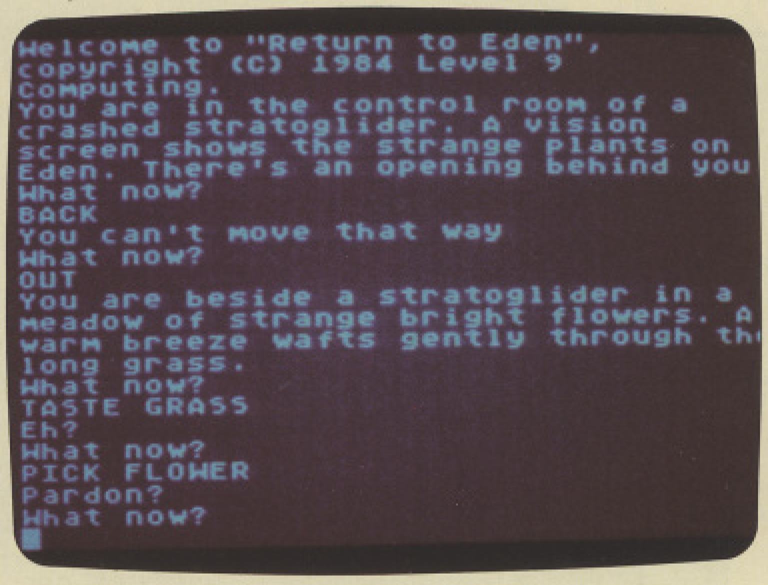
690	Draws the frog.
730	Frog safely home. Adjusts score.
820	Sound routine.
850	Splat!
960	Calculates bonus and sets up next level.
1140	Redefines character set.



Frog Jump is just one of the many sample programs in "Making the Most of Your Atari" by Paul Bunn. We're grateful to Interface Publications for permission to reprint it.

```
700 IF H=1 THEN COLOR 7:PLOT X3,8
710 COLOR C:PLOT X,Y:RETURN
720 FOR W=1 TO 10:SOUND 0,W,10,15:NEXT
 W
730 X1=X:Y1=Y:X=10:Y=19
740 FOR W=1 TO 10:SOUND 0,W,10,15:NEXT
 W
750 FOR W=10 TO 1 STEP -1:SOUND 0,W,10
,15:NEXT W
760 SOUND 0,0,0,0:COLOR C:PLOT X1,Y1
770 F=F+1:SC=SC+200:IF SC>2000 AND E=1
 THEN E=0:M=M+1
780 HF=0
790 IF BB<>0 THEN SC=SC+BB:BB=0
800 IF F=6 THEN F=0:GOSUB 960:GOTO 210
810 RETURN
820 FOR W=55 TO 50 STEP -1
830 SOUND 0,W,10,15:NEXT W
840 SOUND 0,0,0,0:RETURN
850 FOR W=11 TO 15
860 COLOR W:PLOT X,Y:SOUND 0,W*8,10,15
870 FOR P=0 TO 50:NEXT P:NEXT W
880 COLOR 32:PLOT X,Y:M=M-1
890 COLOR OC:PLOT X,Y
900 SOUND 0,0,0,0:OC=32
910 IF M=0 THEN 930
920 X=10:Y=19:HF=0:RETURN
930 POSITION 5,10:? #6;"game over"
940 IF PEEK(53279)=6 THEN RUN
950 GOTO 940
960 GRAPHICS 17
970 IF T<10 THEN POSITION 5,10:? #6;"N
O BONUS":GOTO 1030
980 G=INT(RND(1)*400)+200
990 K=INT(T/10+LL):BO=K*G:SC=SC+BO
1000 POSITION 7,5:? #6;"BONUS"
1010 POSITION 2,7:? #6;K;" * ";G;" = "
;BO
1020 FOR W=1 TO 7
1030 FOR P=255 TO 0 STEP -13:POKE 708,
P:SOUND 0,P,10,10:SOUND 1,255-P,12,10:
NEXT P
1040 NEXT W:SOUND 1,0,0,0
1050 GRAPHICS 17:SETCOLOR 0,2,3:SETCOL
OR 1,12,5:SETCOLOR 2,13,8:SETCOLOR 3,2
,8:SETCOLOR 4,8,1:LL=LL+1
1060 IF LL>1 THEN 1110
1070 L1$=" !!!!!              "
1080 C2$="  ###  ###  ###  ###  ###"
1090 IF SC>2000 AND E=1 THEN E=0:M=M+1
1100 POKE 756,RAM/256:T1=50:RETURN
1110 L2$=" !!    !!    !!    !!  ":L2$(7,
7)=CHR$(186):L2$(8,8)=CHR$(187)
1120 GOTO 1090
1130 GOTO 270
1140 ? #6;" PLEASE WAIT -"
1150 ? #6;" REDEFINING THE"
1160 ? #6;" CHARACTER SET"
1170 C=0:FOR Q=0 TO 2048
1180 A=PEEK(57344+Q)
1190 POKE RAM+Q,A
1200 NEXT Q
1210 POKE 756,RAM/256:RESTORE 1260
1220 READ C:IF C=-1 THEN RETURN
1230 BA=RAM+(C*8)
1240 FOR Q=0 TO 7:READ V:POKE BA+Q,V:N
EXT Q
1250 GOTO 1220
1260 DATA 1,255,135,255,225,255,135,25
5,255,3,0,119,34,254,255,254,34,119
1270 DATA 4,255,255,255,255,255,255,25
5,255,5,255,255,255,255,255,255,255,0,
6,130,214,124,124,124,124,214
1280 DATA 146,7,66,66,90,60,60,60,90,1
29,8,128,71,56,124,124,56,71,128,9,1,2
26,28,62,62,28,226,1
1290 DATA 10,129,90,60,60,60,90,66,66,
11,73,42,20,42,20,42,73,0,12,0,42,20,4
2,20,42,0,0
1300 DATA 13,0,8,20,42,20,8,0,0,14,0,0
,20,8,20,0,0,0,15,0,60,66,90,90,66,60,
0
1310 DATA 26,0,28,126,255,99,1,0,0,27,
0,6,15,6,142,254,248,112,-1
1320 FOR W=150 TO 50 STEP -1:SOUND 0,W
,10,15:NEXT W:SOUND 0,0,0,0:BB=200:HF=
1:H=0:HH=1:X3=19:RETURN
1330 LOCATE X3,8,XX:IF XX<>32 AND XX<>
166 THEN H=1
1340 X3=19
1350 RETURN
```





V



To venture forth with graphics or not, that is the question...

HAVING looked last month at the origins of adventures and examined some of the infuriating problems that adventure writers set for their victims, this month I'd like to take a closer look at the different types of adventure there are on the market.

As with most popular activities, there are two rival factions within the adventuring fraternity, and the divide between them is a small yet fundamental one.

The argument can be summarised very simply as being text versus graphics, or, put more simply, should an adventure game contain pictures or not?

The former camp, those who prefer their adventures with text only, can be described as the traditionalists of the adventuring world, arguing that the most powerful picture-creating computer in existence is the one lodged firmly inside the human skull.

On the other hand, most recent adventure releases on the Atari, Infocom and Level 9 being the best known exceptions, have mainly tended to be of the text plus graphics variety.

Indeed, on most of the other micros they cover, Level 9 have switched to the graphics approach.

Infocom remain resolute.

Within this framework, of course, the edges become distinctly blurred, particularly with the tendency of arcade games to have a more

adventure-like theme to them.

The sequence seems to have been that from the development of the first adventures, on large mainframe computers, which by the nature of the machines were text-only, the home micro adventures which emerged were cutdown versions of the same.

The introduction of graphics to these games stem from two factors.

Firstly, home micros have an ability to produce colour drawings without having to sacrifice huge chunks of memory, which their mainframe ancestors did not.

Secondly, using graphics in a game took away the dry text-only appearance of the adventure, making it more appealing to the arcade-game freaks for whom adventures were classified under "D" for Dull!

Now this adventurer is a confirmed "text" person, so any conclusions drawn from this article should be seen in that light.

Text, as anyone who has played an Infocom game will know, can be far more illuminating than some state-of-the-art graphics.

That is not to say that there are no good graphic adventures.

The recent Adventure International "Questprobe" releases, The Incredible Hulk and Spiderman, have some of the best illustrations seen in adventures, and the addition of graphics to the previous Scott Adams games series shows the demand for these games is obviously there.

However, as Scott himself admits, once a picture has been seen, it can become a little tedious waiting for it every time you revisit that location.

The addition of graphics also reduces the amount of memory left available to the programmer for his game.

Like it or not, the amount of actual playability is reduced by the introduction of graphics. More pictures equals less text.

While this may not be a handicap to the smaller game, it is an equation which means a game the size of, say, any of the Zork Trilogy will not be given graphics for some time to come.

If I had to think of the best reason for the inclusion of graphics in a game, then it would have to be as a visual stimulation to the player's own imagination.

This is the main reason why the "Questprobe" series works.

The characters depicted are faithfully reproduced from their comic-book origins, and so the player's imagination is not being forced to accept something which is at odds with his own ideas.

At the same time, it seems clear that the software producers see the inclusion of graphics as a means of improving the appeal, and therefore the sales, of their products.

This by no means signals the end of the text adventure.

Rather I see graphics as a stepping-stone for people who would otherwise probably never play an adventure to see how enjoyable such a game can be.

And to be totally fair, there is nothing quite as dull as a badly-written text adventure, full of spelling mistakes, inadequate descriptions, or full of hundreds of locations where nothing, or very little happens.

With the recent spate of announcements of new machines with improved memories and better graphics, I can only look forward to reviewing a game with the textual excellence of Infocom, combined with the artistic brilliance of Adventure International.

Just as long as they leave this poor stick-in-the-mud with the option to turn off the pictures.

Brillig

Now lock up the Filthy Fifteen

IF you like adventures you like solving puzzles, so here's one to bend your brain cells around.

No doubt you've heard of the Dirty Dozen. Well in this little concoction you are a prison guard responsible for the Filthy Fifteen – the toughest, dirtiest, most unsociable bunch of prisoners you could ever wish to meet.

In fact they're so unfriendly they can't even stand each other's company for more than one night. This means that no pair of prisoners can ever be together more than once, and they sleep three to a cell.

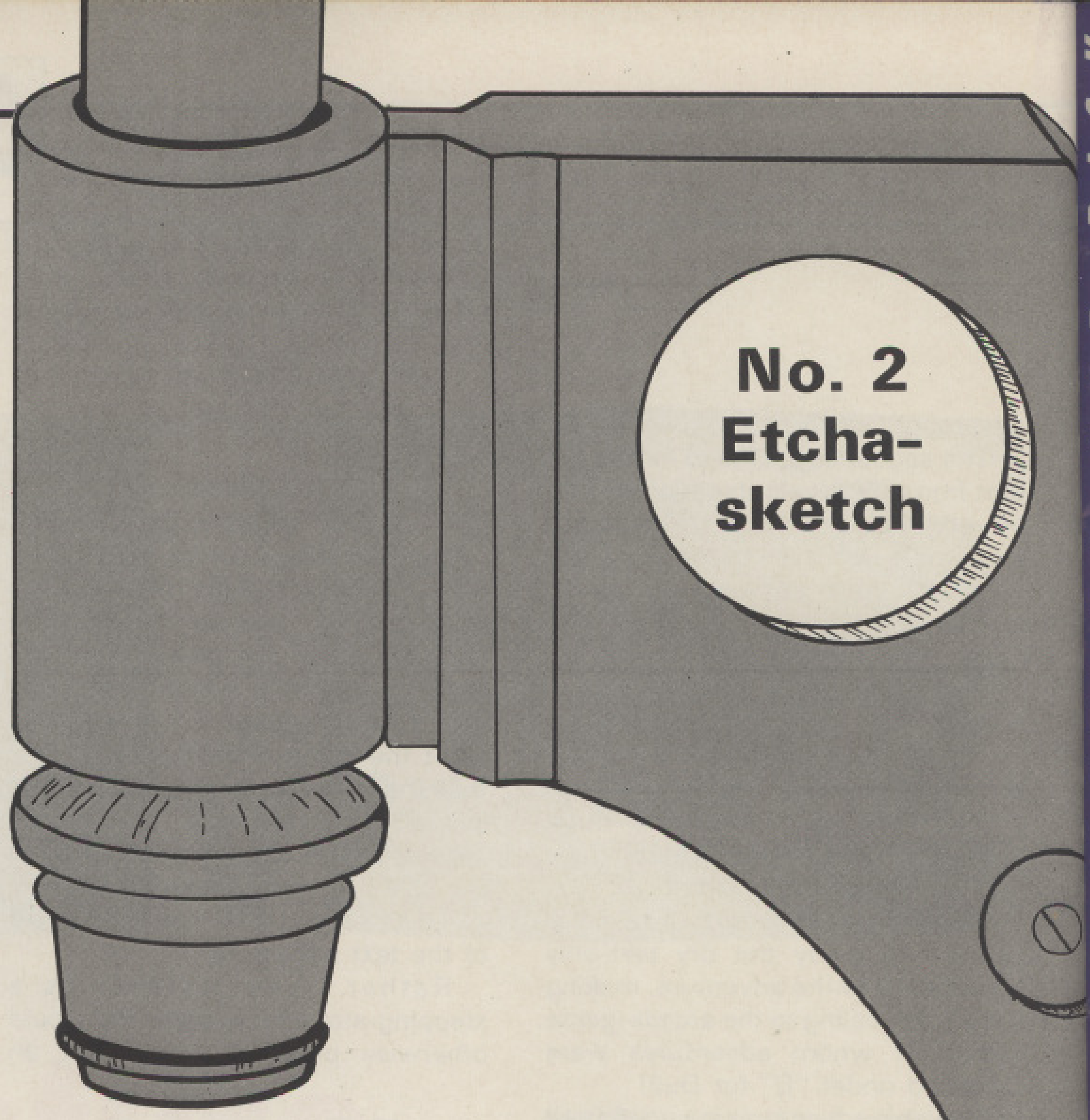
It's your job, with only five cells at your disposal, to keep them happy for a week, otherwise you'll have a riot on your hands.

You should have seen the last place they stayed at when they'd finished with it!

Of course the *real* challenge is not simply to find an answer but to work out the solution. If you manage it, don't write to us ... we'll print the solution next month.

```
10 REM THE FILTHY FIFTEEN
20 DIM P(15,15),N(15)
30 FOR I=1 TO 15
40 N(I)=1
50 FOR J=1 TO 15
60 P(I,J)=0
70 NEXT J
80 NEXT I
90 FOR NIGHT=1 TO 7
100 PRINT "NIGHT ";NIGHT
110 FOR CELL=1 TO 5
120 PRINT "CELL ";CELL
130 PRINT "The 3 prisoners are ";:INPUT X,Y,Z
140 IF X=Y OR X=Z OR Y=Z THEN PRINT "DON'T CHEAT":GOTO 120
150 IF N(X)=NIGHT AND N(Y)=NIGHT AND N(Z)=NIGHT THEN 170
160 PRINT "PRISONER ALREADY LOCKED":GOTO 120
170 IF P(X,Y)+P(X,Z)+P(Y,Z)=0 THEN 190
180 PRINT "PRISONERS REFUSE TO SHARE A CELL AGAIN":GOTO 120
190 N=NIGHT+1:N(X)=N:N(Y)=N:N(Z)=N
200 P(X,Y)=1:P(X,Z)=1:P(Y,X)=1:P(Z,X)=1:P(Z,Y)=1
210 NEXT CELL
220 PRINT "DAY BREAKS AND NO RIOT SO FAR"
230 NEXT NIGHT
240 PRINT "WELL DONE YOU ARE PROMOTED GOVERNOR":STOP
```

Micro Scope



THIS month we look at a program which gives you an "etcha-sketch" facility. Move the joystick to draw and press the joystick button to clear the screen.

```
100 DIM XMOVE(20),YMOVE(20)
110 COLOR 1:SETCOLOR 0,2,8
120 GRAPHICS 7+16
130 X=80:Y=40
140 XMOVE(5)=1:YMOVE(5)=1
150 XMOVE(6)=1:YMOVE(6)=-1
160 XMOVE(7)=1:YMOVE(7)=0
170 XMOVE(9)=-1:YMOVE(9)=1
180 XMOVE(10)=-1:YMOVE(10)=-1
190 XMOVE(11)=-1:YMOVE(11)=0
200 XMOVE(13)=0:YMOVE(13)=1
210 XMOVE(14)=0:YMOVE(14)=-1
220 XMOVE(15)=0:YMOVE(15)=0
230 SOUND 0,0,0,0
240 IF STRIG(0)=0 THEN GRAPHICS 7+16
250 S=STICK(0)
260 X=X+XMOVE(S):Y=Y+YMOVE(S)
270 TRAP 300
280 PLOT X,Y
290 GOTO 240
300 X=X-XMOVE(S):Y=Y-YMOVE(S)
310 FOR VOLUME=15 TO 0 STEP -1
320 SOUND 0,136,10,VOLUME
330 FOR DELAY=1 TO 10:NEXT DELAY
340 NEXT VOLUME
350 GOTO 230
```

100	Sets up two arrays to hold the horizontal and vertical increments.
110	Sets up the colour information.
120	Selects whole-screen mode 7.
130-220	Initialise variables and set up the movements corresponding to the different joystick positions.
230	Turns off the sound.
240	Clears the screen if the joystick button is pressed.
250	Looks at the joystick position.
260	Calculates the position to move to.
270	Traps an error, most likely to be an out-of-bounds error.
280	Plots a point at the new position.
290	Checks the joystick again. The program is a perpetual loop which needs an interrupt (Break or Reset) in order to jump out of the loop and stop execution.
300	The program jumps to here if an error occurs. Since this is most likely to be an out-of-bounds error caused by trying to go off the screen, this line goes back to the last plotted position. It reverses the calculation performed in line 260.
310-340	Make a noise to signify that an error has occurred.
350	Goes back to the main part of the program.



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RaNDom thoughts

KEVIN EDWARDS considers RND – the Basic command which can produce some unexpected results

ONE of the many Basic commands which is taken for granted is RND. Simple in use, it conceals some very clever goings on in the heart of your Atari.

When RND is executed the Basic interpreter generates a random number between 0 and 1. Typical results could be 0.239148332 and 0.851762314.

One area where RND is used a great deal is in shuffling a pack of cards. Without random numbers the same cards would be dealt in the same order. This results in a very boring game – the next card can be predicted.

Any serious card game must have some random element involved in the card shuffling and dealing to make the game realistic.

Other uses include simulating dice, controlling movement in games and so on. All in all, RND is well worth exploring.

The following command will print a random number between 0 and 1:

```
PRINT RND(1)
```

The number within the brackets after the RND has no real effect on the random number returned. Try changing the 1 in the above example to 100. As you will see, it still prints a number between 0 and 1.

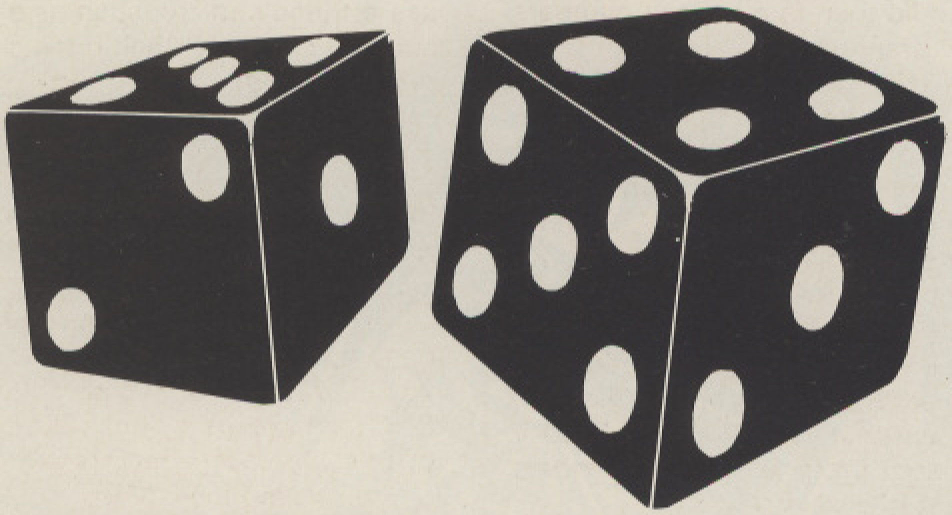
For the majority of cases random numbers between 0 and 1 are useless. What we need to do is turn them into more useful integers (whole numbers). For example, to simulate a six-faced die we would use the following program:

```
10 PRINT INT(RND(1)*6)+1
20 GOTO 10
```

This will print random integers between 1 and 6. Let's take a close look at line 10. As you can see, the result of the RND(1) is multiplied by 6. This is done to increase the number so that it is between 0 and 5.99999999 instead of 0 and 1.

Now the INT command takes the integer part of the result. This means that 1.999 would become 1 and 2.23478 would become 2. You see, INT doesn't round the number, but chops off all the digits after the decimal point. In our case the resulting integer will be between 0 and 5 (inclusive).

Now the final part of the command, the +1, is executed. This adds one to the result and produces a number between 1 and 6. It's as easy as that. And there's as much chance of getting a 1 as a 6 – no loaded dice here!



There are two other ways of generating random numbers which come into play when working in machine code, when Basic's RND is unavailable. One is to write your own random number routine and the other is to PEEK location 53770, the latter option usually being taken because it is easier to implement in machine code.

Location 53770 ($D20A in hex) is a random number generator that produces random values between 0 and 255 (a byte). To prove it try the following program:

```
10 PRINT PEEK(53770)
20 GOTO 10
```

This is the same as the more long-winded program given below:

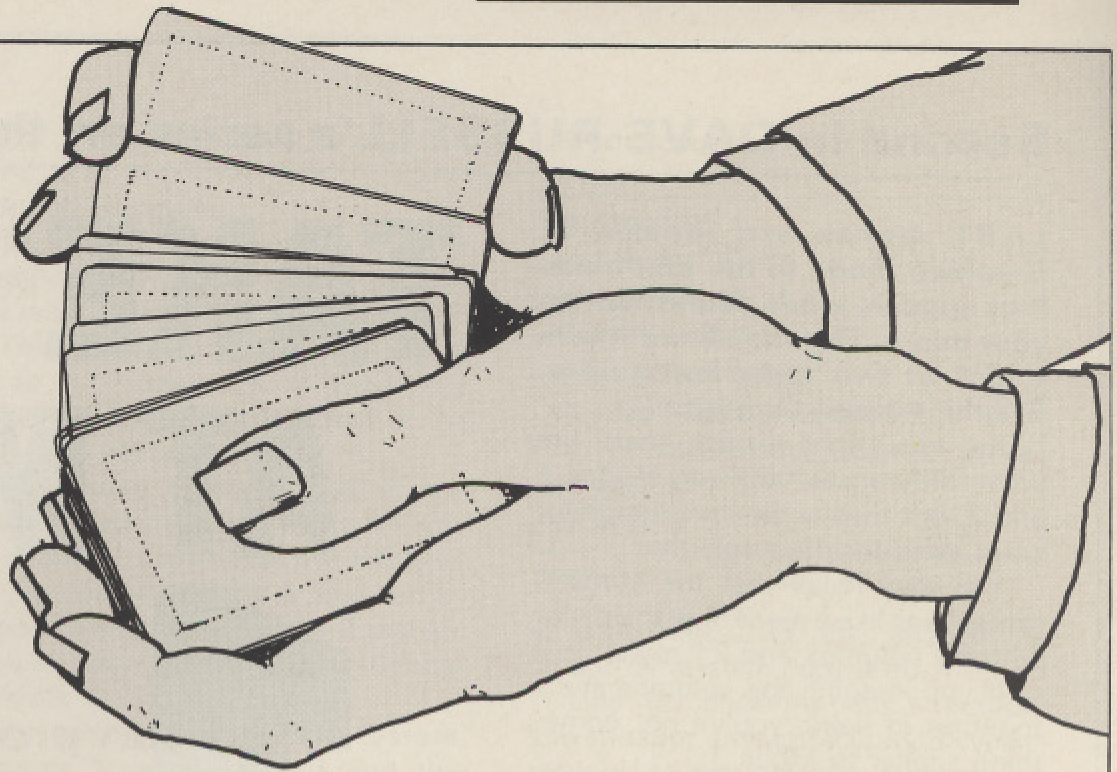
```
10 PRINT INT(RND(1)*256)
20 GOTO 10
```

An obvious drawback of PEEKing

```
seed=$3FF8

4000 A0 04      random LDY #4
4002 B9 F8 3F   ag2    LDA seed,Y
4005 6D FA 3F          ADC seed+2
4008 4D F9 3F          EOR seed+1
400B A2 04             LDX #4
400D 2E FA 3F   again  ROL seed+2
4010 5D F8 3F          EOR seed,X
4013 F9 F8 3F          SBC seed,Y
4016 FD F8 3F          SBC seed,X
4019 0A                ASL A
401A 7E F8 3F          ROR seed,X
401D CA                DEX
401E 10 ED             BPL again
4020 88                DEY
4021 D0 DF             BNE ag2
4023 68                PLA
4024 60                RTS
```

Listing I: Random number generator source program.



location 53770 is that only random bytes can be generated, limiting us to numbers in the range 0 to 255. Problems arise when we want to use this PEEKing method to generate a random number between, say, 1 and 42. Unfortunately there is no simple way of doing this.

Anyway, PEEKing ready-built random number generators is cheating. It's more of a challenge to write your own routine to create such numbers.

The next program we'll look at is a machine code equivalent to PEEKing location 53770. Take a look at Listing I. This is the source listing of the random number routine.

Those of you with last month's issue can enter the program using Hexer. The code should be entered at location $4000 (16384). Remember, all you enter is the hexadecimal bytes at the right of the memory locations. If you are one of the unfortunate people who do not have Hexer type in Program I.

Hexer users should use the execute option to test the routine. The execution address is $4000. When the routine has finished five random bytes will have been stored in memory starting at location $3FF8 (16376). Use the examine option to see them.

If you've typed in Program I and RUN it the random numbers will be printed out automatically. Now each byte printed may look very random, but in fact the numbers are identical each time you RUN the program.

Write down the first few bytes generated by the new routine and compare them with the numbers printed when the program is re-run if you don't believe me.

What we have done is to generate pseudo-random numbers. By this I mean the sequence of numbers printed repeats itself each time the routine is executed, but individual numbers appear to have no relation to one another.

If the numbers printed had been 1,2,4,8,16,32 we would reject them automatically – we could easily predict what the next number is, 64, and could therefore say the numbers are not random.

Creating a routine to generate pseudo-random numbers is very awkward. What we have to do is perform several operations on a series of numbers to produce another set of numbers (random) so that both sets bear no obvious relation to each other.

There is, of course, a relationship between the two sets, but it is so complex that it cannot be readily calculated from a list of numbers generated by the routine.

To produce different sequences of random numbers you can seed the random number generator with different values before calling the routine.

Seeding means setting up the initial values of the set of numbers used by the routine. Changing these initial numbers causes the sequence of numbers generated to be different. In Program I line 40 seeds all the bytes with the value 20.

If you're using Hexer you can change the seeds by altering the contents of locations $3FF8 to $3FFC.

If you change the seed number in line 40 from 20 to 30 and RUN the program, the number sequence will be different. In fact, if you delete the line which seeds the random number generator you'll get different random bytes each time you RUN the program, since your "new" seeds are what's left over from the last time it was called.

The Atari computers are very intelligent because they always generate true random numbers. If you use a friend's micro, such as a BBC, and you turn it off then on and enter the command:

```
PRINT RND(1)
```

you'll always get the same number. This is because it always seeds the random number generator with the same values.

I hope this has thrown some light on random numbers for you. I'm sure you'll agree that working through random numbers routines can be a lot of fun. It's always interesting to see how each routines differ.

Why not try writing one yourself? Be careful though, you often find your generator has a bias in it. For example, some routines seem to pick a lot of 0s and 255s.

Has anyone out there come up with a program to test how random a particular generator is? If so – or if you've got any "random contribution" to make – we'd love to hear from you.

```
10 REM RANDOM NUMBERS
20 REM BY Kevin Edwards
30 REM (C) ATARI USER
40 FOR L=16376 TO 16380:POKE L,20:
   NEXT L
50 FOR L=16384 TO 16420
60 READ M:POKE L,M
70 NEXT L
80 A=USR(16384)
90 FOR L=0 TO 4
100 PRINT PEEK(L+16376);" ";
110 NEXT L
120 PRINT
130 GOTO 80
140 DATA 160,4,185,248,63,109,250
150 DATA 63,77,249,63,162,4,46,250
160 DATA 63,93,248,63,249,248,63,253
170 DATA 248,63,10,126,248,63,202,16
180 DATA 237,136,208,223,104,96
```

Program I

Second in DAVE RUSSELL's series on the Atari's graphics modes

TAKE A LOOK AT MODES 1 and 2

LAST month we looked at Graphics Mode 0, the text mode that appears when you switch on your micro. This month we'll take a look at two other text modes, Graphics 1 and Graphics 2.

As you might expect, there are some differences between Modes 1 and 2, but they're similar enough for us to consider them together.

You may recall that the Mode 0 screen was like a piece of graph paper with 40 columns and 24 rows.

If you imagine the columns stuck together in pairs, you've got something similar to Mode 1.

To be more accurate, the Mode 1 screen has two parts. The top part is like pairs of Mode 0 columns stuck together, while the bottom part is exactly the same as Mode 0 columns.

That is, Mode 1 has a 20 rows by 20 columns section, immediately underneath which are four rows of 40 columns.

The conceptual move to Mode 2 simply requires you to imagine the Mode 1 "fat" rows stuck together in pairs. This gives a 10 rows by 20 columns section, again with four rows of 40 columns beneath.

You can see the way these sections are separated quite clearly by typing GRAPHICS 1 and pressing Return.

Assuming you were in Mode 0 before you did this, your screen has suddenly been transformed into a large black area with a small strip of Mode 0 blue at the bottom.

This strip is four lines deep, and you should see the word READY on the second line and the cursor immediately beneath it on the third line.

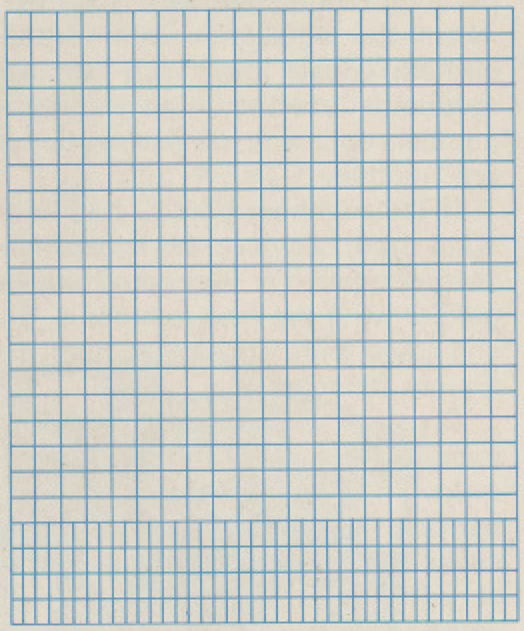
If you press Return a few times, the word READY will move up the screen. On the third press, it will disappear.

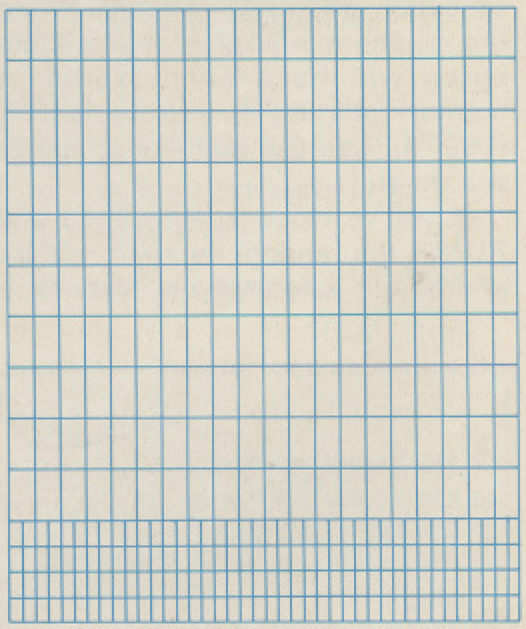
If you had a program in memory and typed LIST now, the listing would be displayed on these four lines only.

It's not very useful being able to read only four lines of a program at a time, which is why program writing and debugging tends to get done in Mode 0.

The four lines are what is sometimes called a "text window" and anything you PRINT will appear here.

Try the simple exercise in Program I. When you Run it, the cursor will end up on the bottom line.





```
20 GRAPHICS 1
30 PRINT "MODE 1 TEXT WINDOW"
```

Program I

This means that if you'd had another line of print, the first would scroll out of the window. Add a line 40 to Program I as follows:

```
40 PRINT "THIS IS AN EXTRA LINE"
```

When you Run the program now, the first line of print scrolls off, leaving only the output from line 40 visible.

At this point, you might be tempted to ask what use the text window is if it can only display the last line to be printed.

We can make better use of it by causing the program to wait after it has written something to the text window.

In this way, the text already there won't scroll off until we want it to do so.

For example, type in and Run Program II. You should now have three lines of text in the window and

```
10 DIM A$(1)
20 GRAPHICS 1
30 PRINT "MODE 1 TEXT WINDOW"
40 PRINT "THIS IS AN EXTRA LINE"
50 PRINT "PRESS RETURN"
60 INPUT A$
```

Program II

the cursor should be on the fourth line, just after a question mark.

The reason the text stays there is because the program is waiting for something before it continues.

Line 60 tells the machine to expect an input from the keyboard, and it will wait until it gets the signal that an input has been made – the signal that is sent when Return is pressed.

If you now press Return, all the text scrolls out of the window to make way for the Ready message and the cursor.

I wouldn't want to claim Program II as a major contribution to programming, but it should illustrate one possible use of the text window.

You can print simple messages and take inputs while all the main action is happening on the rest of the screen.

Oh yes, I'd forgotten about the top 20 rows of the screen which are what Mode 1 is all about! Getting something on there is almost as easy as getting it into the text window.

Program III shows how you can write some text to the main part of the screen.

Instead of a simple PRINT, you must use PRINT# 6. The# 6 (read as hash-six) means "print to channel six".

If you Run this program you'll see our name in lights. Note the orange colour of the letters.

```
10 GRAPHICS 1
20 POSITION 5,5
30 PRINT #6;"ATARI USER"
```

Program III

Now, type in line 30 again, only this time put our name in lower case as follows:

```
30 PRINT #6;"atari user"
```

When you Run this version, the name still appears in upper case (capital) letters, but the colour has changed to green.

Try typing our name in inverse upper case or inverse lower case and see what colours are produced.

This illustrates two aspects of Mode 1. Firstly, it's a five-colour mode, and secondly only half of the character set is available.

We'll take a closer look at the character set next month, but for now let's look at controlling the colours.

Our use of PRINT# 6 followed by upper case letters meant that register 0 was selected and this register defaults to orange.

By using lower case letters, register 1 was selected and this defaults to green.

If you typed the message in upper case inverse, this selects register 2 and so it should have appeared in blue.

‘Mode 1: A five colour mode with just half the character set available’

Finally, using lower case inverse selects register 3 and so the message should have appeared in red.

You'll notice that no matter how you type it in, our name still gets printed in upper case letters. That's what I meant by saying that only half of the character set is available.

We *can* access the other half and get lower case letters, but we'll leave that for next month.

Register 4 controls the background colour and this defaults to black. You can change this using the SETCOLOR command as we did in Mode 0.

If you are in Mode 1, enter SETCOLOUR 4, 2, 6 and press Return to see the effect of changing the background colour.

The 4 selects register 4, the 2 selects colour 2 (orange) and the 6 sets the luminance.

The SETCOLOR command is the key to changing the other registers from their default values. You can see the effect of this by entering Listing IV and running it.

Because the message in line 60 is in upper case, we can change its colour by altering register 0.

```
10 GRAPHICS 1
20 FOR A=1 TO 5
30 FOR B=0 TO 15
40 POSITION 5,5
50 SETCOLOR 0,B,6
60 PRINT #6;"ATARI USER"
70 FOR DELAY=1 TO 100:NEXT DELAY
80 NEXT B
90 NEXT A
```

Program IV

Line 50 performs the alteration and the loop set up by line 30 cycles through all the available colours.

The luminance is kept at a constant value of 6, and line 70 simply keeps each colour on the screen long enough for it to be seen.

There is another way to get a character on the Mode 1 screen, by using the COLOR and PLOT commands.

For example, with a clear Mode 1 screen (which you can get by pressing Reset and typing GR.1), type COLOR 65:PLOT 5,5 and press Return.

The slightly confusing aspect of this method is that the COLOR command doesn't select a colour in Mode 1.

Instead, it selects the character to be PLOTted, in this case character 65 or A as we know it.

Hence, if you entered the line as suggested, you should have an orange A at screen position 5,5.

You can still use SETCOLOR to change the colour of the character that you plot. If you change line 60 in Program IV to read:

```
60 COLOR 65:PLOT 5,5
```

and delete line 40 (because it isn't needed), you can see the A cycle through the same colours as our name did.

If you want to put a large piece of text on the Mode 1 screen, it's obviously easier to use PRINT # 6 than lots of COLOR/PLOT combinations.

However, there are times when you might need to use COLOR, so Program V shows how to produce a familiar result with line 30 READing

```
10 GRAPHICS 1
20 FOR A=1 TO 10
30 READ X
40 COLOR X
50 PLOT A+5,5
60 NEXT A
70 DATA 65,84,65,82,73,32,85,83,
   69,82
```

Program V

the character DATA from line 70.

Selecting a colour register is not quite as straightforward with COLOR/PLOT as it is with PRINT#6. I'll cover it in detail next month because the difficulties are connected with the missing half of the character set.

However, to see the sort of thing you can do, change line 40 of Program V to read:

```
40 COLOR X+32
```

The message should now appear in green.

Instead of adding 32 to *all* the numbers in the DATA statement, you can use the method selectively to produce a mixed colour display.

For example, retype line 40 as it originally appeared in Program V and alter line 70 to read:

```
70 DATA 97,84,97,82,105,0,85,115,
   69,114
```

If you compare the two versions of line 70, you'll notice that I've added 32 to some of the values, causing those characters to be printed in green while the remainder are still printed in orange.

So far, I've not discussed Mode 2 at all. That's because everything I've said about Mode 1 applies to Mode 2.

If you change the GRAPHICS 1 in all the programs to read GRAPHICS 2, you'll get very nearly the same results.

The only differences will be the size of the text and its position on the screen.

As I said earlier, Mode 2 rows are like two Mode 1 rows stuck together, so Mode 2 characters are twice as high as those of Mode 1.

'Mode 2 characters are twice as high as those of Mode 1'

This in turn means that the command POSITION 5,5 will refer to a different point on the TV screen depending on whether Mode 1 or Mode 2 is in use.

Mode 1 and 2 also differ in terms of the amount of memory they require – Mode 2 needs less than Mode 1 – but that needn't bother us here.

The programs we'll use won't be long enough to worry about memory considerations!

● *Next month we'll look at how to access the missing half of the character set and how to select a colour register with COLOR/PLOT.*

Just a little DIY can save you quite a lot!

I HAVE just purchased issue 1 of Atari User after weeks of hearing of its impending launch. Congratulations! You have immense potential – I hope your aim is to become the British version of the brilliant Analog.

I am not going to give a list of suggestions for you to consider. I just want to beg you not to go overboard on the games aspect of the Atari, since very few magazine listings can approach commercial programs for quality and durability (and personally, even these don't keep my interest for very long).

Actually, the Hexer utility was a superb start to what looks like becoming an institution in the magazine world.

Hopefully – in the near future after I have managed to get one or two rather important exams out of the way – I will submit some of my own programs and hardware devices for publication.

That point brings me to my only suggestion. Please keep your eyes open for DIY peripherals (RS232, printer, cassette interfaces, and other assorted devices) that cost an arm and a leg to buy ready built even when the manufacturers claim great value.

I don't want to put any one person down, but commercial modems cost well over £100, for example, whereas Maplin Electronic Supplies supply modem kits for around £60-£70 and a nice little interface can be built for less than £50. That is what you call value!

Finally, my copy of Atari User came from a company called Software Express in Birmingham who advertise in your pages. Can I use your pages to thank them for a really express service, and incredibly helpful and polite staff to whom nothing seems too much trouble. – **Martin Sisson, Nottingham.**

● We hope to bring you a range of hardware projects – everything from left-handed joysticks to complete piano-style keyboards.

Even so, some people just don't feel confident about using a soldering iron, which is why there is a market for ready-built modems.

A turn of the screw . . .

I AM the proud owner of an 800XL. On April 23 I ordered the new 130XE from the fabulous Silica Shop. It arrived 72 hours later on the Friday.

Now this is not just a letter of congratulations to Silica Shop; my point is that already having an XL I know what the XE is going to be like. So as soon as I turned on my new XE, I knew that something was wrong.

Basically the colours were extremely dull. Even with the TV colour knob turned on full, the usual bright colours were still dull. I rang Silica Shop to find out what was wrong with my new XE. They told me "Well our XE is all right mate, if you send it in we will either fix it or send a new one".

Well I was extremely disappointed at the prospect of having to send the XE back after all the attention that I had created at work about this brilliant machine.

But luckily at the last minute I discovered a small hole on the base of the computer giving access to a screw adjustment, that enabled me to change the colour output of the computer.

If only Silica Shop had told me that in the beginning. Please tell all your readers about this so that they do not have the same disappointment that I had. – **A.K. Bishop, Cheshunt, Herts.**

● Well spotted! You must have some very small screwdrivers. In general, though, it's best not to go poking about lest you do some damage and simultaneously invalidate your warranty.

How a group can help

CONGRATULATIONS on a first class magazine. The first issue was very informative and useful. I can't wait for the next.

I am really writing to express my feelings towards Atari-devoted user groups. I am very proud to be a listed member of the Lea Valley Atari Users Group (LVAUG), and have been since it started three years ago.

I was at first an Atari 400 user, but was tired with the keyboard and so upgraded to an Atari 800.

I soon became bored with playing games, and began to use my computer as it should be used – to program with.

I started learning Basic with great help from the group, and am now programming quite well (not as good as the officials at the group, but good within my standards).

If it wasn't for the help and advice given at the fortnightly meetings of the LVAUG I would still be a 400 owner playing 16k games. Instead I am using a 48k 800 and making my own games.

This week I bought a Gemini printer with the help of Matthew, the group's vice president and main contributor. He helped me select a printer for my specific needs and within my price range. And so far I haven't had a problem.

I feel that many people around the country just haven't bothered to enrol at a local group, they feel it will be boring, too difficult and advanced, or just too demanding. Indeed, I have found it none of these.

The LVAUG I feel has done me a good job in educating me in the computing world, giving me advice, hints, tips, ideas, and most of all knowledge of what to do.

It is one of my main social events of my week, and I look forward to it. If the officials are too tied up with problems at the meeting, they are always pleased to see me at their own homes, or even at the pub afterwards. – **Mr. Saunders, Broxbourne, Herts.**

Can I use these games?

I'VE got an Atari 800 and I keep seeing people advertising to sell the VCS game cartridges, paddles and joysticks.

If I buy them will I be able to

ATARI USER Mailbag

WE welcome letters from readers – about your experiences using the Atari micros, about tips you would like to pass on to other users . . . and about what you would like to see in future issues.

The address to write to is:

Mailbag Editor
Atari User
Europa House
68 Chester Road
Hazel Grove
Stockport SK7 5NY

use them on my 800? – **Brian Fergusson, Wirral, Merseyside.**

● The good news is that the paddles and joysticks are compatible with all Atari computers, so you can buy some of those.

The not-so-good news is that the VCS game cartridges are different from the cartridges that your 800 accepts, so it's no good your buying any of those.

Crashing the buffers

I agree with you that Alphabet Train (Atari User, May, page 32) is a delightful little program . . . when it works!

I typed in the listing as printed and it works fine as long as you don't try to go further than the ends of the alphabet. If you try to move the train to before A or after Z, the program crashes rather spectacularly.

Is this a deliberate feature, or was there an error in the listing? I hope it's not deliberate because it spoils an otherwise great game, but my meagre abilities in Basic can't spot anything obviously wrong. – **E.H. Millington, Uxbridge, Middlesex.**

● One man's feature is another man's bug, which is what there was in the Alphabet Train listing. It crept in when we added the keyboard option and results from the order of precedence of the logical operators in Basic.

All that is required to fix the bug is to add some parentheses to lines 500 and 510 as follows:

```
500 S=STICK(0): K=PEEK(76
4): IF (S=7 OR K=7) AND X
>6 THEN X=X-1: DIR=-1: PO
KE 764,255
510 IF (S=11 OR K=6) AND
X<156 THEN X=X+1: DIR=1:
POKE 764,255
```

With the parentheses added the program works fine and doesn't allow the user to go beyond the end of the train.

High in the Drop Zone

CONGRATULATIONS on a great new magazine. Your articles are all very good, up to date and interesting. Also special offers are a new and very good idea. For too long now we Atarians have had it too tough, with software being so expensive.

What I would like to see in your magazine are high score tables and tips on adventures. (My high score on Drop Zone is 87,910 and I really need some help on Lords of Time.)

Also here is another good idea you may wish to consider which no other magazine offers – a prize of a piece of software for every letter and program published.

Please keep your magazine the same sort of format. All too often an excellent magazine is ruined by naff ideas. – **D. Gratton, Leicester.**

● We suspect you must have three hands if you scored 87,910 on Drop Zone!

The only way we could get a score like that was with one of us operating the joystick and another pressing the appropriate keys.

The problem with high score tables is that they take up a lot of space, particularly when there are a lot of games around. Also, there's no way of telling that the scores were genuinely obtained – although we're sure that no Atari user would exaggerate!

Hints and tips on adventures will form part of Brillig's Adventuring section, so do send them in. Please try to ask a specific question and we'll try to print the answers in a way that doesn't spoil the game for other people.

There's a good reason why no magazine gives a piece of software for every letter. Some have tried similar things and quickly dropped the idea because the cost gets too high. We'd rather keep the cover price competitive.

However we do pay for articles and programs published. You won't get rich writing for *Atari User* (well, we haven't, so why should you?) but at least you'll have the satisfaction of knowing that you're helping fellow users.

Check – sum routine needed

I AM pleased to say that I have purchased my first copy of Atari User, Vol. 1, No. 1 and I am even more pleased to tell you that I will be one more of your many readers, for many issues to come.

If it continues, as I am sure it will, to keep to issue No. 1 standards, it will be, I feel sure, the number one magazine for Atari.

To be honest with you I have gone over it several times to see if I can make any complaint. I can find none. Excellent, please keep it up.

There is however one thing I would like to see, that is some kind of code listing typo, similar to what we are used to in magazines like Antic. This is a great help to the many, many new Atari users. Is this possible for you to do? – **Les Bostock, Lea Village, Birmingham.**

● All this praise has the editorial team positively blushing! No more, please, or it will go to their heads.

We're still pondering on the question of a check-sum routine. Like most things in life, there are advantages and disadvantages.

For example, it could be argued that they confuse the people who need them most and that it's good to get some practice at de-bugging.

On the other hand, a good check-sum routine can save some time once you've entered the routine itself. We'd welcome reader's opinions on this while we're pondering.

A way? There are two!

I'VE finally managed to get enough money together to buy a 1050 disc drive. My friends mostly have older drives – they saved up faster than me – and so run DOS 2.

I know there's an option on my DOS 3 that will let me take files off their discs onto one of mine, but we can't work out how to do the opposite.

If I write a program and save it on a disc, how can I give it to my friends?

There must be a way, but we can't work it out. Can you? – **Wayne Exley, Burgess Hill, Sussex.**

● There are two ways to transfer files from DOS 3 to DOS 2. The easiest is to load the program from your disc, save it to cassette, switch the micro off and then reboot from one of your friend's DOS 2 discs.

With DOS 2 booted, you can load the file from cassette and then save it to disc.

The other way is to find a utility program which enables the transfer without going via cassette. Such programs have appeared in print and indeed we hope to print our own version in a few month's time.

Of course, DOS 2.5 may solve all these problems.

This chip is on our menu

I FOUND Mike Cook's article in the May issue of Atari User on the 6502 chip very interesting and informative.

Might I suggest you get him to write a similar article on the 68000 chip which will be used in the new ST machines? I'm sure many of your readers would find it interesting as well as me. – **Frank Robbins, Milton Keynes, Bucks.**

● Would you believe Mike has already written such an article? It should appear in next month's issue.

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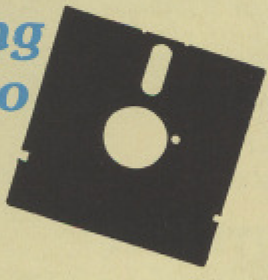
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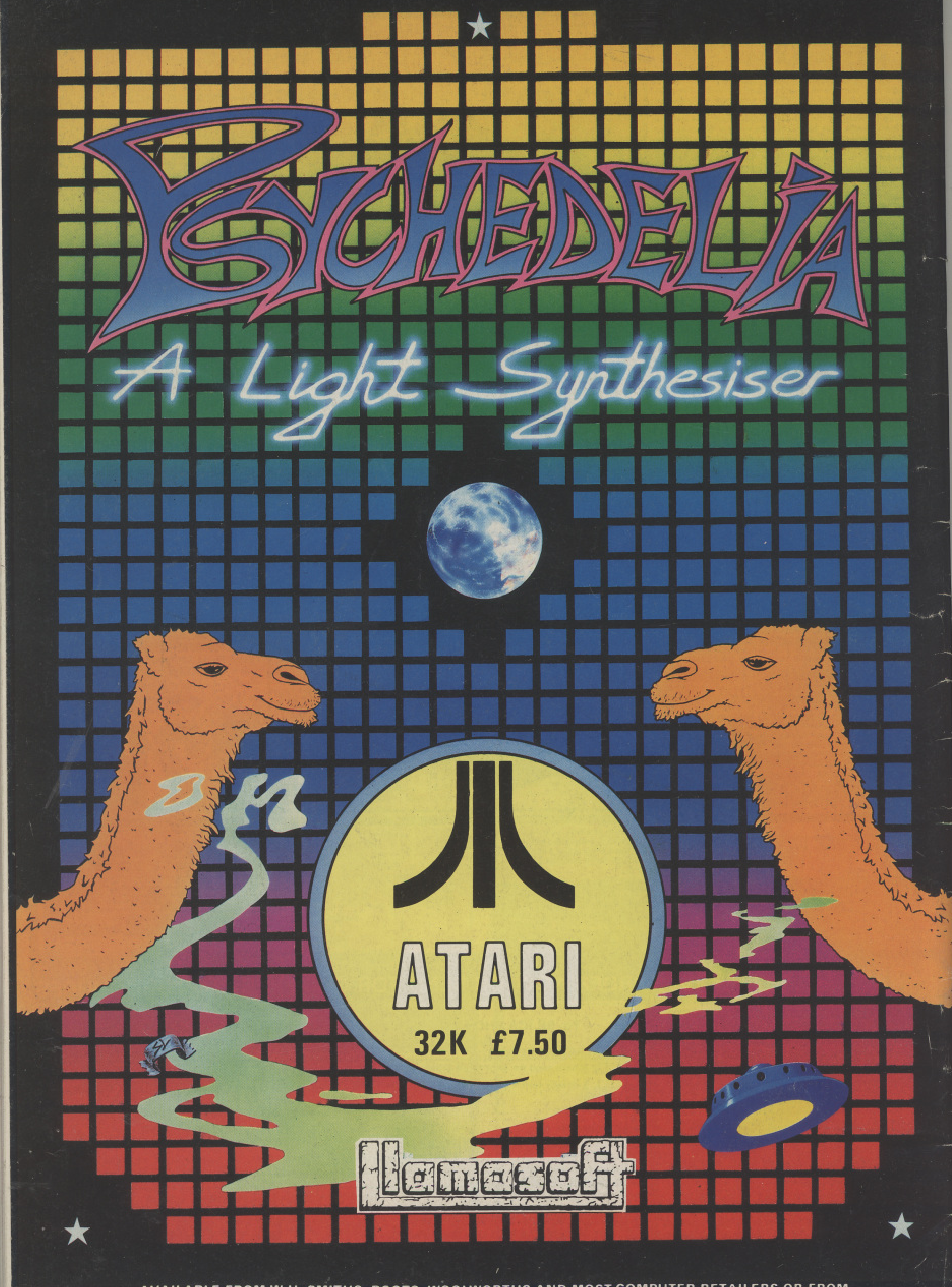
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